

Applications Area General Issues and Simulation Project

Torre Wenaus, BNL/CERN
LCG Applications Area Manager

<http://lcgapp.cern.ch>
<http://lcgapp.cern.ch/project/simu/>

SC2

April 16, 2004



Outline

- ◆ **General issues**
 - ◆ Experiment take-up
 - ◆ Issues highlighted by Matthias (more in project talks)
 - ◆ Future of PI, future of SEAL, role of ROOT, generic simulation framework
 - ◆ Still evolving, but we tell you where things are
 - ◆ Milestones: Level 1, last quarter performance, upcoming
 - ◆ Brief comments on personnel resources
- ◆ **Simulation**
 - ◆ Focus on status, plans, manpower
 - ◆ Not much background info... no time!



General



Apps General and Simu – SC2-preview issues

Slide 3

Torre Wenaus, BNL/CERN



Focus on Experiment Need

- ◆ Project structured and managed to ensure a **focus on real experiment needs**
 - ✓ **SC2/RTAG** process for need-driven requirements, monitoring
 - ✓ AF involving architects in management and execution
 - ✓ **Open** information flow and decision making
 - ✓ **Direct participation** of experiment developers in the projects
 - ✓ **Iterative feedback** with frequent releases
 - ✓ **Early deployment and evaluation** in experiments
- ◆ **Success defined by experiment adoption and production deployment**

Evaluation and feedback from experiment integration/validation/usage efforts is now a major focus



Experiment take-up

- ◆ You'll hear the definitive situation later from expts, but in general...
- ◆ Experiences span (almost?) the full range of possibilities
 - ◆ Successful delivery and take-up of essential software
 - ◆ e.g. POOL – integrated and/or in production use by 3 experiments
 - ◆ Successful delivery but missing take-up (to date)
 - ◆ e.g. SEAL component model, a basic element of the agreed blueprint – two (at least) experiments plan to integrate it, but no experiments have done so to date
 - ◆ We seek to avoid cases of ‘delivered but not needed software’
 - ◆ Non-delivery due to lack of demand and (correlated) lack of applied effort
 - ◆ e.g. Generic simulation framework – the 4-experiment consensus that this was needed, during the simu RTAG, is gone
 - ◆ Failure to deliver what was promised and is needed
 - ◆ I cannot cite an example – I hope no one else can either!



Flagged Topic: Future of PI

- ◆ PI today: mainly supporting what's been done – bug fixes, minor extensions based on experiment input
 - ◆ Low manpower: secondary activity of a couple of people
- ◆ Our long-time position: “We will revisit PI in light of ARDA”
 - ◆ ARDA not fully illuminated yet
- ◆ Principal PI (& broader) issue that is more than support-what's-been-done is **physicist interface to event collections**
 - ◆ Which is also something we said we'd address in light of ARDA, e.g. proposed joint work package with ARDA on collections
 - ◆ Present position on this (agreed in the last AF) is to get a discussion going: a few phone discussions followed by a mini-workshop
 - ◆ ‘Place-holder’ home for this in the POOL collections WP, with broadened participation (including PI)



Flagged Topic: Future of SEAL

- ◆ SEAL has a broad program providing software for three experiments (ALICE expresses no interest in SEAL)
- ◆ ‘Future of SEAL’ issue is mainly in one WP
- ◆ Surveying the main WPs:
 - ◆ Foundation – libraries used by (almost) all other components
 - ◆ Mathlib – agreement among 3 experiments and ROOT to proceed with a long term project
 - ◆ Dictionary – key to POOL, interactivity, introspection; in use by 3 experiments and collaborating with ROOT to converge on a common dictionary
 - ◆ Framework – here is the question mark! (next slide)
 - ◆ Scripting – interactivity tools and the ‘python bus’ agreed by 3 experiments in the blueprint as central to the architecture; ROOT collaboration here too (pyROOT)



SEAL Framework WP

- ◆ Early conclusion in AA planning: common event processing framework was not realistic
- ◆ Instead: agreement (in blueprint) on developing common framework services
 - ◆ But clearly a delicate area, see bullet 1
- ◆ SEAL has developed some but experiments have yet to adopt them
- ◆ LHCb and ATLAS plan to integrate and evaluate them after DCs
- ◆ CMS plans are less clear
- ◆ We may face the issue, at what experiment adoption count do we reach the threshold of a common project? Two, or three?
 - ◆ But we hope SEAL can satisfy CMS requirements also
- ◆ New work is suspended in this WP pending experiment feedback



Flagged Topic: Role of ROOT

- ◆ Mandated by management, recommended by internal review: move beyond user-provider to a deeper, more peer-to-peer collaboration with a more coherent program that avoids duplication of work
- ◆ Specific collaborative efforts agreed in AF and incorporated into (SEAL) workplan
- ◆ We believe benefit will flow both ways
 - ◆ ROOT benefiting SEAL/LCG-AA: years of experience developing, optimizing and responding to user feedback on dictionary and math functionality
 - ◆ SEAL/LCG-AA benefiting ROOT: collaboration on refactoring of the dictionary; potential improvement on C++ parsing; comprehensive mathlib project; pyROOT



Flagged Topic: Generic Simulation Framework

- ◆ Simulation RTAG, Oct 2002:
 - ◆ The RTAG recommends, as a longer term goal, that a generic detector simulation be developed
 - ◆ address general simulation infrastructure and services
 - ◆ use different simulation engines in transparent way
- ◆ The consensus on this – always a bit shaky and ill-defined, and with the real interest in collaborating and in using the existing ALICE work unclear – has since evaporated
 - ◆ Primary reason expressed by CMS, ATLAS, LHCb: success of Geant4 in reaching production quality
 - ◆ Less interest in easy accessibility of alternative engines in the near term – but experiments still express interest in FLUKA
- ◆ The project responded to the shaky interest by not assigning LCG manpower – only manpower was the experiment simulation people
 - ◆ Their effort level would follow their priority assessment – and manpower input was negligible (priority to Geant4)



Generic Framework – Present and Future

- ◆ One truly interested user: the simulation physics validation subproject
 - ◆ Simulation validation with common geometry in test beams
- ◆ In October 2003, re-scoped in light of this:
 - ◆ Initial ‘prototype by end 2003’ milestone redirected at narrower specific needs of physics validation: Geant4+FLUKA+FLUGG
 - ◆ Incomplete but well advanced: working but needs generalization
 - ◆ No ‘generic simulation framework development’ effort
 - ◆ Instead, leverage existing (GDML) work to provide a simple ‘gateway’ from G4-based simulation geometries to the ALICE/ROOT VMC
 - ◆ Enable evaluation of the VMC with existing detector geometries
 - ◆ AF, Geant4, GDML developer, ROOT all seem interested in GDML approach; will propose a specific program in the next ~month
- ◆ We propose to establish *no generic framework objectives beyond the provision of the gateway*
 - ◆ Any further work would come only after a new mandate



New Level 1 Milestones

2004/12/31

Development, support and resource plan through 2008

lcg:1.1.1 1.3

Keys: ms major lcg1 lcg2 lcg app WBS: lcg:/lcg/app

With the LCG-funding of manpower in the applications area running down during 2004 and 2005, a plan is required to establish the level of long-term support that is required for the products that are essential for the experiments. This plan will lead to the definition of more detailed milestones.

2005/9/30

Phase 1 AA software complete and deployed

lcg:1.1.1 1.4

Keys: ms major lcg1 lcg2 lcg app WBS: lcg:/lcg/app

Phase 1 applications area software -- full required functionality -- available and successfully used in ATLAS, CMS and LHCb.

Products include POOL, SEAL, Geant4, ROOT, conditions database, event collections, analysis services, generator services, etc. A detailed description of the milestone as a union of specific Level 2 technical and adoption milestones will be defined with Milestone #2 in December 2004.



Recent Level 2 Milestone Performance

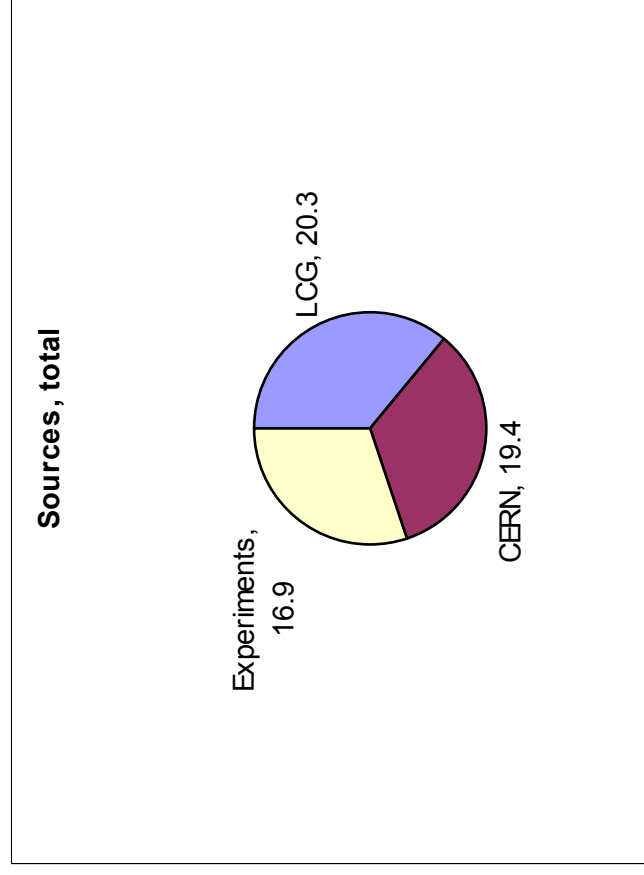
2003/6/30	Done v=18	SEAL V1 release	lcg:1.1.1.3	1.130
2003/6/30	Done v=0	Generator librarian and alpha version of support infrastructure in place	lcg:1.1.1.5.6	1.138
2003/7/1	Done v=3	Physicist interface (PI) workplan completed	lcg:1.1.1.4	1.153
2003/7/31	Done v=0	CMS POOL integration: POOL persistency of CMS event	lcg:1.1.1.2.1	1.176
2003/7/31	Done v=240	Math library workplan in place	lcg:1.1.1.3.8	1.184
2003/8/15	Done	SPI support for Windows binary version of LCG software	lcg:1.1.1.1	1.170
2003/9/10	Done v=1	ATLAS POOL integration: POOL persistency in Release 7	lcg:1.1.1.2.1	1.177
2003/9/15	Done v=24	SEAL support for Windows binaries	lcg:1.1.1.3	1.187
2003/9/15	Done v=24	AIDA interface review (users) completed	lcg:1.1.1.4.1	1.171
2003/9/30	Done v=94	POOL RDBMS independence layer in beta	lcg:1.1.1.2.1	1.116
2003/9/30	Done v=115	POOL support for Windows binaries	lcg:1.1.1.2.1	1.181
2003/9/30	Done v=0	First cycle of EM physics validation complete	lcg:1.1.1.5.4	1.143
2003/9/30	Done v=24	Statement on GSL and NAG usage for math library	lcg:1.1.1.3.8	1.124
2003/10/31	Done v=-10	CMS POOL validation with PCP data	lcg:1.1.1.2.1	1.180
2003/11/15	Done v=9	Initial POOL deployment on LCG-1	lcg:1.1.1.2.1	1.114
2003/11/30	Done v=60	SPI tools operational on IT CVS service	lcg:1.1.1.1	1.188
2003/12/15	Done v=110	2004 persistency framework workplan complete	lcg:1.1.1.2	1.117
2003/12/31	Done v=56	Simulation physics requirements revisited	lcg:1.1.1.5.4	1.140
2003/12/31	Late	Generic simulation framework prototype available (G4 and FLUKA)	lcg:1.1.1.5.1	1.144
2004/2/1	Late	First cycle of hadronic physics validation complete	lcg:1.1.1.5.4	1.145
2004/2/16	Done v=0	SPI-G4 collaborative infrastructure pilot	lcg:1.1.1.5.2	1.189
2004/2/20	Done v=-16	savannah.cern.ch migrated to GNU savannah	lcg:1.1.1.1	1.199
2004/3/1	Done v=0	Agreement on formats for event generator common samples	lcg:1.1.1.5.6	1.197
2004/3/15	Done v=-6	POOL hierarchical cataloging production release	lcg:1.1.1.2.1	1.121
2004/5/15		RH 7.3 gcc 3.2.3 supported	lcg:1.1.1.1	1.217
2004/5/31		POOL RDBMS abstraction layer completed	lcg:1.1.1.2.1	1.219
2004/5/31		External software guideline document	lcg:1.1.1.3	1.203
2004/5/31		Review/prioritization of simple benchmarks for simu physics validation	lcg:1.1.1.5.4	1.213
2004/5/31		SPI/EGEE collaborative workplan complete	lcg:1.1.1.1	1.212

Future Level 2 Milestones

2004/3/1	Done v=0	Agreement on formats for event generator common samples	lcg:1.1.5.6	1.197
2004/3/15	Done v=-6	POOL hierarchical cataloging production release	lcg:1.1.2.1	1.121
2004/5/15		RH 7.3 gcc 3.2.3 supported	lcg:1.1.1	1.217
2004/5/31		POOL RDBMS abstraction layer completed	lcg:1.1.2.1	1.219
2004/5/31		External software guideline document	lcg:1.1.3	1.203
2004/5/31		Review/prioritization of simple benchmarks for simu physics validation	lcg:1.1.5.4	1.213
2004/5/31		SPI/EGEE collaborative workplan complete	lcg:1.1.1	1.212
2004/6/15		Workbook for SEAL	lcg:1.1.3	1.204
2004/6/25		Geant4 6.2 release - resource usage refinements	lcg:1.1.5.2	1.209
2004/6/30		RDBMS independency achieved for POOL relational components	lcg:1.1.2.1	1.220
2004/6/30		Common interface for Conditions DB defined	lcg:1.1.2.2	1.221
2004/6/30		New Dictionary API and reference implementation	lcg:1.1.3	1.205
2004/7/1		Beta version of MCDB in production in the LCG environment	lcg:1.1.5.6	1.198
2004/7/1		Certification of external software for the new Linux platform	lcg:1.1.1	1.216
2004/7/15		mathlib project web	lcg:1.1.3.8	1.206
2004/7/15		LCG AA build system selection	lcg:1.1.1	1.201
2004/7/31		Conditions DB production release	lcg:1.1.2.2	1.222
2004/8/31		First release of the POOL Relational Storage Manager	lcg:1.1.2.1	1.223
2004/9/1		Agreement on parton-level event generator file format	lcg:1.1.5.6	1.202
2004/9/15		Comparison of LHC calorimeters for EM shower development	lcg:1.1.5.4	1.214
2004/10/1		First version of the C++ mathlib package	lcg:1.1.3.8	1.207
2004/10/1		First generic simulation framework production release	lcg:1.1.5.1	1.147
2004/10/15		Second iteration of hadronic physics validation complete	lcg:1.1.5.4	1.215
2004/10/15		Consolidated Geant4 acceptance suite for LHC	lcg:1.1.5.2	1.210
2004/10/31		POOL meets scalability requirements	lcg:1.1.2.1	1.122
2004/10/31		POOL integrates ROOT4	lcg:1.1.2.1	1.224
2004/12/1		Generator production framework beta	lcg:1.1.5.6	1.208
2004/12/17		Geant4 7.0 release - physics models and geometry	lcg:1.1.5.2	1.211
2004/12/31		Development, support and resource plan through 2008	lcg:1.1	1.3
2004/12/31		Simulation test and benchmark suite available	lcg:1.1.5.4	1.146
2004/12/31		Final physics validation document complete	lcg:1.1.5.4	1.148
2005/3/1		Full function release of POOL persistence framework	lcg:1.1.2.1	1.218
2005/9/30		Phase 1 AA software complete and deployed	lcg:1.1	1.4

Applications Area Personnel Resources

- ◆ LCG AA personnel resources stable for now
- ◆ Similar contribution levels from CERN, experiments
- ◆ Decline due to LCG departures will start in early 2005
- ◆ **AA, LCG management, EP/SFT management began this week the resource planning necessary to address this**



September 2003 numbers.

Experiment number includes CERN people working on experiments



LCG developer / experiment Associations

- ◆ Report/proposal delivered to the AF in Jan, addressing potential for greater use of LCG developer-experiment associations to improve experiment support/integration
- ◆ For the most part, the report showed that eligible people already carry experiment assignments, some fixed, some task-based and variable
- ◆ No feedback; ‘proposal’ part (in POOL) was implemented anyway
- ◆ Status:
 - ◆ POOL – all eligible developers have an experiment association
 - ◆ SEAL – assignment of its (2-3) developers is task-based, in view of small numbers and diverse program
 - ◆ Simulation – developers already have task-based associations based on current work
 - ◆ SPI – eligible developers have already migrated to other projects
 - ◆ PI – no dedicated developers



Simulation



Simulation Project

Torre Wenaus et al

- ◆ **Generic simulation framework (already addressed)**
 - ◆ Generic interface to multiple simulation engines (G4, FLUKA), building on existing ALICE work (VMC)
- ◆ **Incorporates longstanding CERN/LHC Geant4 work**
 - ◆ Aligned with and responding to needs from LHC experiments, physics validation, generic framework
- ◆ **FLUKA team participating**
 - ◆ Framework integration, physics validation
- ◆ **Simulation physics validation**
 - ◆ Physics requirements; hadronic, em physics validation of G4, FLUKA; framework validation; monitoring non-LHC activity
- ◆ **Generator services**
 - ◆ Generator librarian; common event files; validation/test; development when needed

Andrea
Dell'Acqua

John
Apostolakis

Alfredo
Ferrari

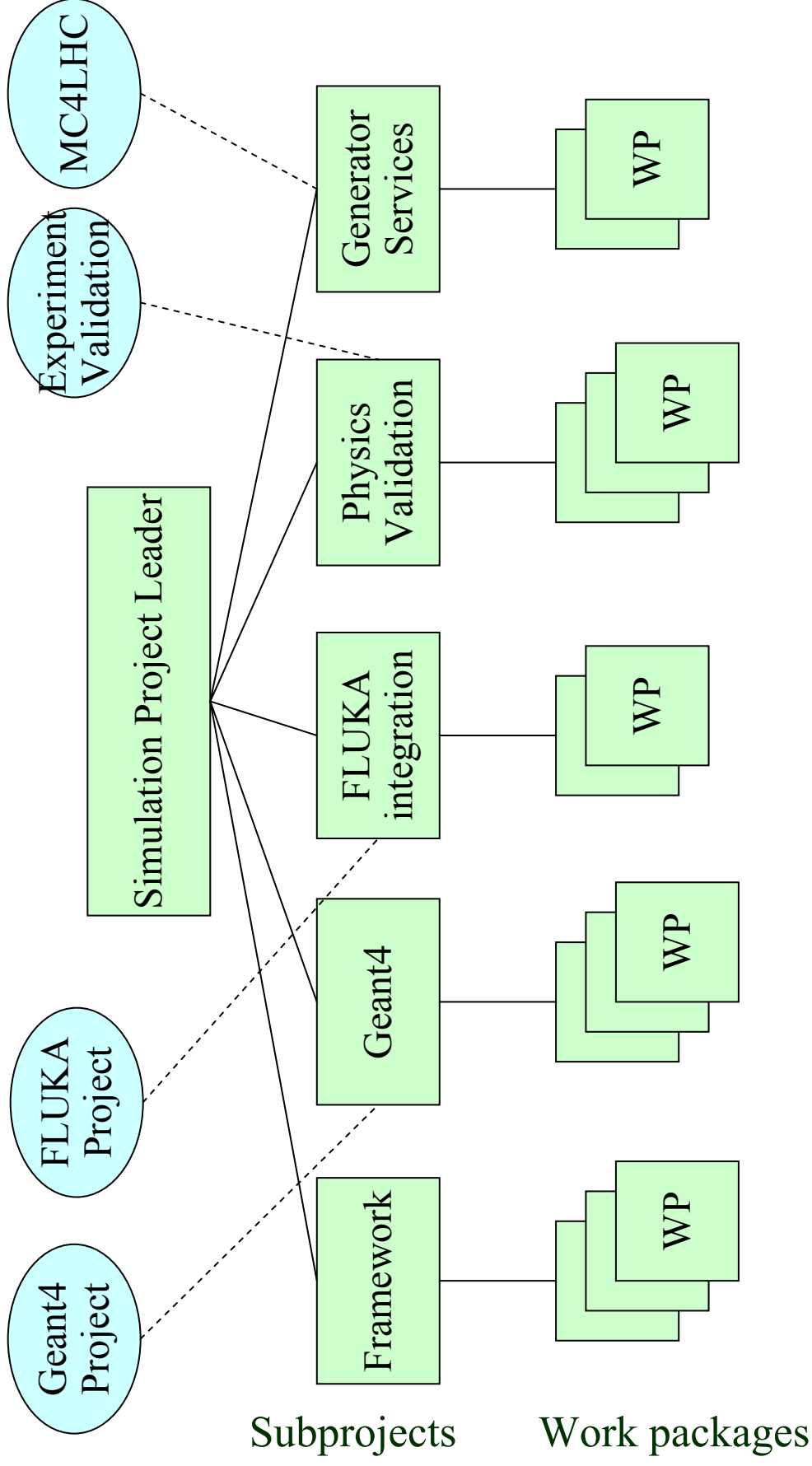
Fabiola
Gianotti

Paolo
Bartalini



We're renewing the effort to find a simu project leader (ie not me)

Project Organization



Geant4

- ◆ Effort has been well **focused on the specific needs** of the LHC
- ◆ Continuing major CERN role in the **leadership of Geant4 as a whole helps** with making our priorities collaboration priorities
- ◆ Close collaboration – including much manpower overlap – with **simulation physics validation**
- ◆ Important improvements in **physics modeling and physics lists**, with validation by and feedback from the physics validation subproject
- ◆ Shift in emphasis **from development to production support**
 - ◆ Quickly identifying and fixing problems, performance, improved testing
 - ◆ Not to the exclusion of development; requests are still coming in
- ◆ We see the **results** of this coupled with strong experiment commitment and work: CMS DC production, ATLAS DC pre-production with Geant4, LHCb soon to begin pre-production



Geant4 Milestone Summary

- ✓ Dec 2003 – **Major Geant4 6.0 release** targeting (with subsequent minor releases) **LHC production**. Physics lists included in release
- ✓ Feb 2004 – **Savannah prototype** portal for problem report for Geant4
- ✓ Mar 2004 – Fixes, revision and improvements, focused on improving **production usage** in LCG experiments (Geant4 6.1)
- ◆ Jun 2004 – Improvements in use of computing resources, including **performance** and memory use, and refinements to specific physics models, persistency and windows support (Geant4 6.2)
- ◆ Sep 2004 – Requested **developments and refinements**, including additional geometry volume registration, physics model refinements
- ◆ Oct 2004 – First consolidated **acceptance suite** for LHC applications
- ◆ Dec 2004 – Contributions to **major release 7.0** of Geant4, focused on improvement of physics models and additional geometry functionality



Geant4 Manpower

Available manpower	Geometry	Hadronics	EM Phys	Software Mngmnt	System Testing	Acceptance Suite	Coordination
J Apostolakis	0.25						0.75
G. Folger		0.80		0.20			1.00
G Cosmo	0.50			0.25			0.25
HP Wellisch		1.00					1.00
I McLaren				0.20	0.50		0.70
V Grichine			1.00				1.00
S Sadirov				0.25	0.75		1.00
M Kossov		1.00					1.00
V Ivantchenko			0.25				0.25
A Ribon		0.20				0.20	0.40
G Daquino	0.25						0.25
O Link	1.00						1.00
Total FTEs	2.00	3.00	1.25	0.90	1.25	0.20	1.00
							9.60

Essentially the same levels/distribution as in the past. Matches the planned program.

Simulation Physics Validation

- ◆ **Important milestones met**
 - ◆ Sep 2003 – Initial round of EM physics validation completed
 - ◆ G4 EM physics ‘at least as good as or better than G3’
 - ◆ Feb 2004 – Simulation physics requirements revisited
 - ◆ Report covering requirements of the four experiments issued
 - ◆ Apr 2004 – Initial round of hadronic physics validation completed
 - ◆ Validation is done; report is being completed
 - ◆ Apr 2004 – First FLUKA + G4 validation results from test beam
 - ◆ Using G4 geometry and FLUGG
- ◆ **Second simple benchmarks study (pion absorption) nearing completion**
 - ◆ Will be followed by review, assessment (e.g. data availability), prioritization and selection of further simple benchmark studies to do



Physics Validation Future Milestones

- ◆ Jun 2004 – Review/prioritization of further simple benchmarks
 - ◆ Selection of any further studies based on prioritized need, physics interest, data availability, manpower availability
- ◆ Sep 2004 – Comparison of LHC calorimeters for EM shower development
 - ◆ EM shower profiles identified in first round of validation as needing further work
- ◆ Oct 2004 – Second iteration of hadronic physics validation complete
 - ◆ Identified issues will be documented in the report from the first round
- ◆ Dec 2004 – Simulation test and benchmark suite available
 - ◆ Capturing the validation work performed in a test suite
- ◆ Dec 2004 – **Final physics validation document complete**
 - ◆ Foreseen as final physics validation report



Physics Validation LCG Manpower

- ◆ Witek Pokorski – working on simple benchmarks and on generic framework (in practice, more on simple benchmarks; for generic framework, general infrastructure supporting test beam physics validation)
- ◆ Giuseppe Daquino (G4 team) – works on the radiation background simulation with G4, e.g. biasing. For physics validation, the practical example chosen is background studies in the LHCb detector environment.
- ◆ Alberto Ribon – works on the comparison simulation-data for the hadronic interaction test-beam of the ATLAS pixels.
 - ◆ Main purpose not to understand the ATLAS test-beam data and the simulation, given that those data are not very "clean", but to resurrect FLUGG and hence run G4 and FLUKA starting from the same geometry
 - ◆ cf. the 'generic simulation prototype' objective
 - ◆ Results presented in a talk last week
- ◆ Manuel Gallas Terraireira – working on the ATLAS combined test-beam simulation concentrating (when there is data in a few weeks) on G4 and FLUKA validation
 - ◆ Looking at aspects which are relevant for all LHC experiments (and not for ATLAS-specific purposes).
- ◆ Total 2.5-3 FTEs
- ◆ Always encouraging greater participation by the experiments!



Generator Services

- ◆ Well advanced on major objective of a generator library – GENSER
 - ◆ ATLAS has migrated to it for DC2, CMS decision for DC05 soon
- ◆ Supports growing list generators, including all first-priority ones
 - ◆ List as of mid-April: HERWIG, PYTHIA, HIJING, ISAJET, LHAPDF, ALPGEN, COMPHEP, EvtGen, Glauber Xs ... in 21 versions
- ◆ Common event file production plans advancing well
 - ◆ Event file database MCDB drawing on previous CMS work/experience
 - ◆ File format agreed (HepMC using POOL/ROOT)
 - ◆ Identified participants for production development/operations
 - ◆ Leveraging existing (probably CMS) production infrastructure
- ◆ Generator validation to rely mainly on collaboration with JetWeb (UK)
- ◆ Future crucially depends on resolving key manpower issues



Generator Services Oversight/Review

- ◆ MC4LHC provides oversight of the subproject, ensuring it is delivering what the experiments need
- ◆ Review of the subproject conducted in March, chaired by Michelangelo Mangano (MC4LHC chair) with participation from experiment experts and many leading generator authors
- ◆ Review report ~end of April, but some concerns already clear
 - ◆ Urgent manpower issues must be addressed:
 - ◆ Stability in project leader, librarian positions
 - ◆ Communication with the generator providers is too weak and must be strengthened
- ◆ Latter point may indicate that generator providers should be better represented in project oversight? (MC4LHC has good experiment representation but not much generator provider representation)



Generator Services Manpower

- ◆ Generator services subproject would not have come into existence without essential manpower coming available:
 - ◆ Paolo Bartalini as project leader – **but contract ends in June!**
 - ◆ Russian participation in LCG AA coordinated by Slava Ilyin
 - ◆ Participant (~1FTE) changes with 3-month rotation of CERN-stationed person
 - ◆ **Experience has shown that rotating librarian is too unstable for effective communication and interaction**
 - ◆ Interested in greater focus on event database/common production
- ◆ So two urgent manpower issues to solve if the project is to go forward
- ◆ Successes in identifying new prospective participants/collaborators
 - ◆ Common event file production – CMS, LCG-Spain
 - ◆ Validation – JetWeb project in UK
- ◆ Prospects for the subproject look good if the present manpower issues can be addressed



Generator Services 2004 Milestones

- ✓ Jan 2004 – **Proposal for MCDB** deployment in the LCG environment
- ✓ Feb 2004 – LHAPDF generator included in generator library
- ✓ Mar 2004 – **Agreed format** for event-level generator files
- ◆ Apr 2004 – COMPHEP, ALPGEN and EVTGEN in GENSER
- ◆ Jun 2004 – **Proposal for generator event production** environment
- ◆ Jul 2004 – Beta version of **MCDB** in production
- ◆ Jul 2004 – **Proposal for an event generator validation** framework
- ◆ Sep 2004 – Agreement on **parton-level event generator file format**
- ◆ Dec 2004 – **Generator production framework beta**

- ◆ Plan extends through 2005 to reach complete, production versions of GENSER, MCDB, validation framework, etc.



FLUKA

- ◆ CERN-INFN agreement signed in December 2003 (not LCG-AA)
 - ◆ John Harvey a member of the liaison group coordinating the CERN-INFN FLUKA collaboration
- ◆ Public FLUKA code circa late 2004
- ◆ FLUKA leader Alfredo Ferrari represents FLUKA in the LCG AA Simulation Project
- ◆ Participation is via support, consultation for the FLUKA-related work undertaken by the project
 - ◆ Consultation and help on simple benchmark studies
 - ◆ Ditto on test beam studies – which took a long time to get going because of unavailability of manpower from experiments, but (as mentioned) is now underway
 - ◆ Support for and help with FLUGG
- ◆ As discussed, present usage context is via Geant4 geometries and FLUGG
- ◆ ‘GDML gateway’ will enable detailed Geant4 detector geometry export to the VMC and FLUKA evaluation via VMC at geometry complexity levels to which FLUGG may not scale



Simulation Milestones

2003/10/15	Done v=60	Report on G4 CPU performance benchmark suite	<u>lcg:1.1.5.2</u>	<u>10015</u>
2003/12/12	Done v=0	Geant4 release 6.0	<u>lcg:1.1.5.2</u>	<u>10016</u>
2003/12/31	Done v=56	Simulation physics requirements revisited	<u>lcg:1.1.5.4</u>	<u>1.140</u>
2003/12/31	Late	Generic simulation framework prototype available (G4 and FLUKA)	<u>lcg:1.1.5.1</u>	<u>1.144</u>
2003/12/31	Done v=14	Proposal for MCDB deployment in the LCG environment	<u>lcg:1.1.5.6</u>	<u>10017</u>
2004/2/1	Done v=5	LHAPDF generator included in generator library	<u>lcg:1.1.5.6</u>	<u>10018</u>
2004/2/1	Late	First cycle of hadronic physics validation complete	<u>lcg:1.1.5.4</u>	<u>1.145</u>
2004/2/16	Done v=0	SPI-G4 collaborative infrastructure pilot	<u>lcg:1.1.5.2</u>	<u>1.189</u>
2004/3/1	Done v=0	Agreement on formats for event generator common samples	<u>lcg:1.1.5.6</u>	<u>1.197</u>
2004/3/2	Late	Detector description (GDML) proposal to PEB	<u>lcg:1.1.5.1</u>	<u>10014</u>
2004/03/25	Done v=1	Geant4 6.1 release - production improvements	<u>lcg:1.1.5.2</u>	<u>10022</u>
2004/4/1	Late	COMPHEP, ALPGEN and EVTGEN generators included in GENSER	<u>lcg:1.1.5.6</u>	<u>10019</u>
2004/5/31		Review/prioritization of simple benchmarks for simu physics validation	<u>lcg:1.1.5.4</u>	<u>1.213</u>
2004/6/1		Proposal for generator event production environment	<u>lcg:1.1.5.6</u>	<u>10020</u>
2004/6/25		Geant4 6.2 release - resource usage refinements	<u>lcg:1.1.5.2</u>	<u>1.209</u>
2004/7/1		Beta version of MCDB in production in the LCG environment	<u>lcg:1.1.5.6</u>	<u>1.198</u>
2004/7/1		Proposal for an event generator validation framework	<u>lcg:1.1.5.6</u>	<u>10021</u>
2004/9/1		Agreement on parton-level event generator file format	<u>lcg:1.1.5.6</u>	<u>1.202</u>
2004/9/15		Comparison of LHC calorimeters for EM shower development	<u>lcg:1.1.5.4</u>	<u>1.214</u>
2004/10/1		Geant4 geometry volume registration	<u>lcg:1.1.5.2</u>	<u>10023</u>
2004/10/15		Second iteration of hadronic physics validation complete	<u>lcg:1.1.5.4</u>	<u>1.215</u>
2004/10/15		Consolidated Geant4 acceptance suite for LHC	<u>lcg:1.1.5.2</u>	<u>1.210</u>
2004/12/1		Generator production framework beta	<u>lcg:1.1.5.6</u>	<u>1.208</u>
2004/12/17		Geant4 7.0 release - physics models and geometry	<u>lcg:1.1.5.2</u>	<u>1.211</u>
2004/12/17		Geant4 physics model prototype concluded	<u>lcg:1.1.5.2</u>	<u>10024</u>
2004/12/31		Simulation test and benchmark suite available	<u>lcg:1.1.5.4</u>	<u>1.146</u>
2004/12/31		Final physics validation document complete	<u>lcg:1.1.5.4</u>	<u>1.148</u>

AA Internal Review Recommendations

- ◆ Set up a testbed for comparison of event generators
 - ◆ In the plan
- ◆ Use HepMC format for in-memory event generator data, and bulk (POOL/ROOT) and low-statistics (XML or other text) storage formats
 - ◆ Agreed and in the plan
- ◆ Experiments encouraged to increase participation in physics validation
 - ◆ Agree!
- ◆ VMC development encouraged
 - ◆ Proceeding, but not in LCG-AA
- ◆ G4/FLUKA/FLUGG infrastructure for physics validation should be set up
 - ◆ In progress
- ◆ In the medium and long term VMC should be the main tool
 - ◆ Agreed by ALICE but not the other experiments
- ◆ Recommend discussion among experiments on VMC interest
 - ◆ Geometry gateway plan to enable VMC evaluation and inform such a discussion



More Info

- ◆ Geant4 subproject detailed plan (coordinated with G4-wide plan)
 - ◆ <http://lcgapp.cern.ch/project/simu/geant4/SI-Workitems-2004-v1.0.doc>
 - ◆ Detailed milestones: <http://lcgapp.cern.ch/project/simu/geant4/SI-Geant4-Milestones-2004.doc>
- ◆ Some Recent Apps Area Meeting Talks on Simu
 - ◆ Geant4 release 6 (Jan)
 - ◆ <http://agenda.cern.ch/fullAgenda.php?ida=a036682>
 - ◆ FLUKA status and plans (Feb)
 - ◆ <http://agenda.cern.ch/fullAgenda.php?ida=a04557>
 - ◆ Simulation physics requirements review (Mar)
 - ◆ <http://agenda.cern.ch/fullAgenda.php?ida=a04970>
 - ◆ Generator services status and plans (Mar)
 - ◆ <http://agenda.cern.ch/fullAgenda.php?ida=a041049>

