

Apps Area General and Simulation 'SC2 Preview'

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PEB

April 13, 2004



SC2 Meeting on AA

- ◆ April 16 SC2 meeting addresses AA
 - ◆ 1.5 hrs of AA presentations:
 - ◆ General, topics flagged by Matthias, simu - Torre - 30'
 - ◆ SEAL - Pere - 15'
 - ◆ Persistency - Dirk - 20'
 - ◆ SPI - Alberto - 15'
 - ◆ PI - Vincenzo - 10'
 - ◆ with times including discussion time.
 - ◆ Another 1.5 hrs of experiment presentations on LCG AA software take-up, validation



SC2 Meeting on AA

- ◆ Topics flagged by Matthias:
 - ◆ future of PI, future of SEAL, role of ROOT, generic simulation framework
 - ◆ last quarter performance, future plans
- ◆ Many of which will still have open questions on Apr 16, but we can say where things are
 - ◆ I will make some comments on the flagged issues in my intro talk, and project leaders can say more in their talks



This Talk

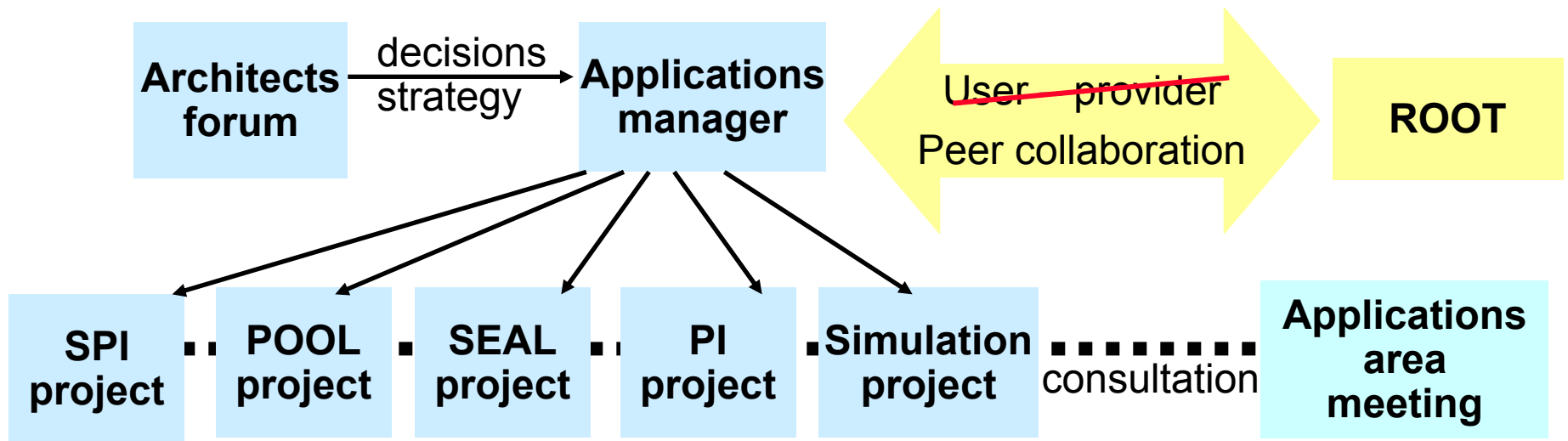
- ◆ Today's purpose (from Les): be sure the PEB isn't surprised by any SC2 talk content
- ◆ General and Matthias-flagged topics planned for the SC2 presentation that should be heard here first
- ◆ Simulation update, particularly workplan changes/updates (not many) – milestones, manpower
 - ◆ Not a major new workplan iteration as for SEAL and POOL; most of the 2004 simu program established 1 or 2 planning cycles ago
- ◆ Not a full presentation of my Friday talk; focus on new material
- ◆ If a fuller discussion of simu is needed or desired, can schedule another session, e.g. Apr 27
 - ◆ No simu subproject leaders could be here today; all are available Apr 27
- ◆ A forthcoming AF meeting will also address simu project status/plans



General



Applications Area Organisation



Focus on Experiment Need

- ◆ Project structured and managed to ensure a focus on real experiment needs
 - ✓ **SC2/RTAG** process to identify, define (need-driven requirements), initiate and monitor common project activities in a way guided by the experiments themselves
 - ✓ **Architects Forum** to involve 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
 - ✓ **Early deployment and evaluation** of LCG software in experiment contexts
 - ◆ **Success defined by experiment adoption and production deployment**

Evaluation and feedback from experiment integration/validation/usage efforts now well advanced



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

- ◆ As Pere's talk will make clear, SEAL has a broad program that in most areas is providing software requested by and used or to-be-used by three experiments (ALICE expresses no interest in SEAL)
- ◆ Surveying the main WPs:
 - ◆ Foundation – mix of in-house and external components and libraries used by (almost) all other WPs
 - ◆ 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, with pyROOT being moved to ROOT distribution



SEAL Framework WP

- ◆ One of the early conclusions when the AA was being launched was that collaboration on a common event processing framework was not realistic
 - ◆ Vested interests, existing investments, architectural differences
- ◆ Instead, as part of the blueprint, basic framework services and services supporting the component model expressed by the blueprint – all central to any event processing framework – would be developed, for integration into experiment-specific frameworks
 - ◆ Clearly a delicate area, see bullet 1
- ◆ SEAL accordingly has developed such services, but the current experiment adoption count is zero
 - ◆ Strong message to SEAL from internal review: you must successfully sell your wares to the experiments if the work is to avoid irrelevancy
- ◆ LHCb and ATLAS, already collaborators on Gaudi framework, express concrete plans to adopt SEAL framework services after this year's DCs
- ◆ CMS plans are less clear
- ◆ Issue we may face is, at what experiment adoption count do we reach the threshold of a common project? Two, or three?
 - ◆ But SEAL should work hard at demonstrating an attractive product to CMS as well as securing LHCb+ATLAS adoption
- ◆ New work is suspended in this WP pending experiment adoption/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 (particularly) SEAL plans based on ongoing technical discussions/work
 - ◆ This week it is before the PEB and the SC2 in the SEAL plan
- ◆ LCG-AA and SEAL strengthened by deeper and more peer-to-peer collaboration with ROOT – and ROOT strengthened as well, e.g.
 - ◆ 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
 - ◆ common project that addresses general simulation infrastructure and services
 - ◆ minimise duplication, waste of effort and divergence
 - ◆ provide the model for collaboration between the experiments and simulation projects
 - ◆ use different simulation engines in transparent and easy-to-customise 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
 - ◆ The primary reason expressed by CMS, ATLAS, LHCb being the success of Geant4 in responding very effectively to LHC needs and reaching production quality
 - ◆ Less interest in a generic layer and easy accessibility of alternative engines in the near term – but experiments still express interest in FLUKA



Generic Simulation Framework

- ◆ The project responded to the shaky interest in this area by not assigning LCG manpower – only manpower was the experiment simulation people
 - ◆ Their dedication of manpower would reflect their assessment of the priority
 - ◆ Manpower input was negligible – priority went to experiment Geant4 simulations
- ◆ One truly interested user: the simulation physics validation subproject
 - ◆ Simulation engine 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
 - ◆ No ‘generic simulation framework development’ effort
 - ◆ Instead, leverage existing work to provide a simple ‘gateway’ from CMS/ATLAS/LHCb simulations (i.e. from their Geant4 geometries) to the ALICE VMC
 - ◆ Enable evaluation of the VMC with detailed detector geometries (as well as test beam configurations)



Generic Framework – Present and Future

- ◆ Initial goal – Geant4+FLUKA+FLUGG based infrastructure supporting physics validation in test beams – partially met
 - ◆ Infrastructure successfully built and applied in one test beam setting
 - ◆ Person assigned to do the (small amount of) work to generalize this to enable application in other test beams
- ◆ GDML (XML based geometry exchange format) identified as a good basis for the ‘gateway’ between Geant4 and VMC (ROOT)
 - ◆ AF, Geant4, GDML developer (an LCG person), ROOT all seem interested
 - ◆ We need to propose a specific program in the next month or so
- ◆ We propose to establish *no* generic framework objectives beyond the provision of the gateway
 - ◆ We stop at providing the mechanism enabling evaluation of the VMC
 - ◆ The experiments can use this as they like on their own schedules
- ◆ 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 1.3

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 1.4

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 Milestones

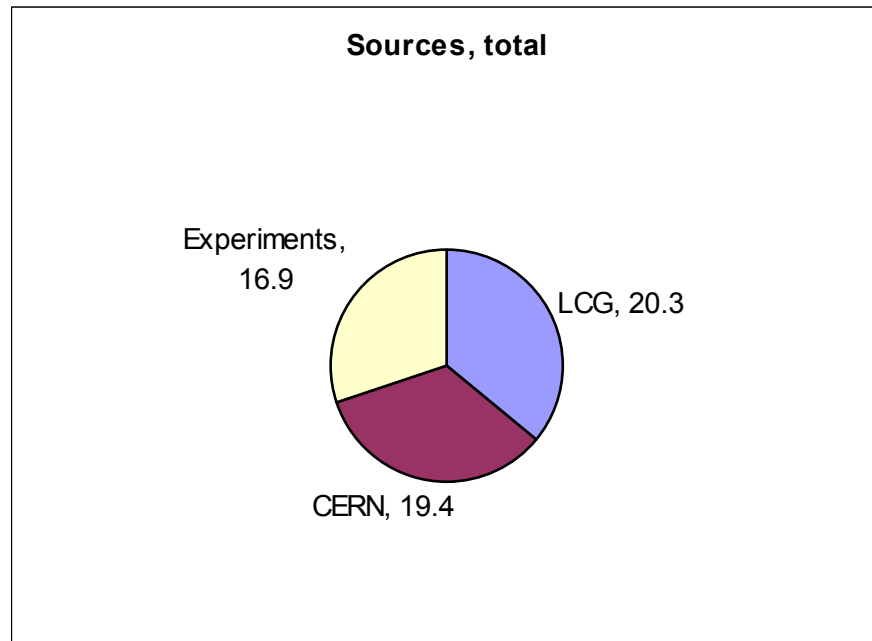
2003/6/30	Done v=18	SEAL V1 release	lcg:1.1.3	1.130
2003/6/30	Done v=0	Generator librarian and alpha version of support infrastructure in place	lcg:1.1.5.6	1.138
2003/7/1	Done v=3	Physicist interface (PI) workplan completed	lcg:1.1.4	1.153
2003/7/31	Done v=0	CMS POOL integration: POOL persistency of CMS event	lcg:1.1.2.1	1.176
2003/7/31	Done v=240	Math library workplan in place	lcg:1.1.3.8	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	1.171
2003/9/30	Done v=94	POOL RDBMS independence layer in beta	lcg:1.1.2.1	1.116
2003/9/30	Done v=115	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	Done v=9	Initial POOL deployment on LCG-1	lcg:1.1.2.1	1.114
2003/11/30	Done v=60	SPI tools operational on IT CVS service	lcg:1.1.1	1.188
2003/12/15	Done v=110	2004 persistency framework workplan complete	lcg:1.1.2	1.117
2003/12/31	Done v=56	Simulation physics requirements revisited	lcg:1.1.5.4	1.140
2003/12/31	Late	Generic simulation framework prototype available (G4 and FLUKA)	lcg:1.1.5.1	1.144
2004/2/1	Late	First cycle of hadronic physics validation complete	lcg:1.1.5.4	1.145
2004/2/16	Done v=0	SPI-G4 collaborative infrastructure pilot	lcg:1.1.5.2	1.189
2004/2/20	Done v=-16	savannah.cern.ch migrated to GNU savannah	lcg:1.1.1	1.199
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

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 persistency 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 begin 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 to the report/proposal. ‘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)

Andrea
Dell'Acqua

- ◆ Generic interface to multiple simulation engines (G4, FLUKA), building on existing ALICE work (VMC)

◆ Incorporates longstanding CERN/LHC Geant4 work

John
Apostolakis

- ◆ Aligned with and responding to needs from LHC experiments, physics validation, generic framework

◆ FLUKA team participating

Alfredo
Ferrari

- ◆ Framework integration, physics validation

◆ Simulation physics validation

Fabiola
Gianotti

- ◆ Physics requirements; hadronic, em physics validation of G4, FLUKA; framework validation; monitoring non-LHC activity

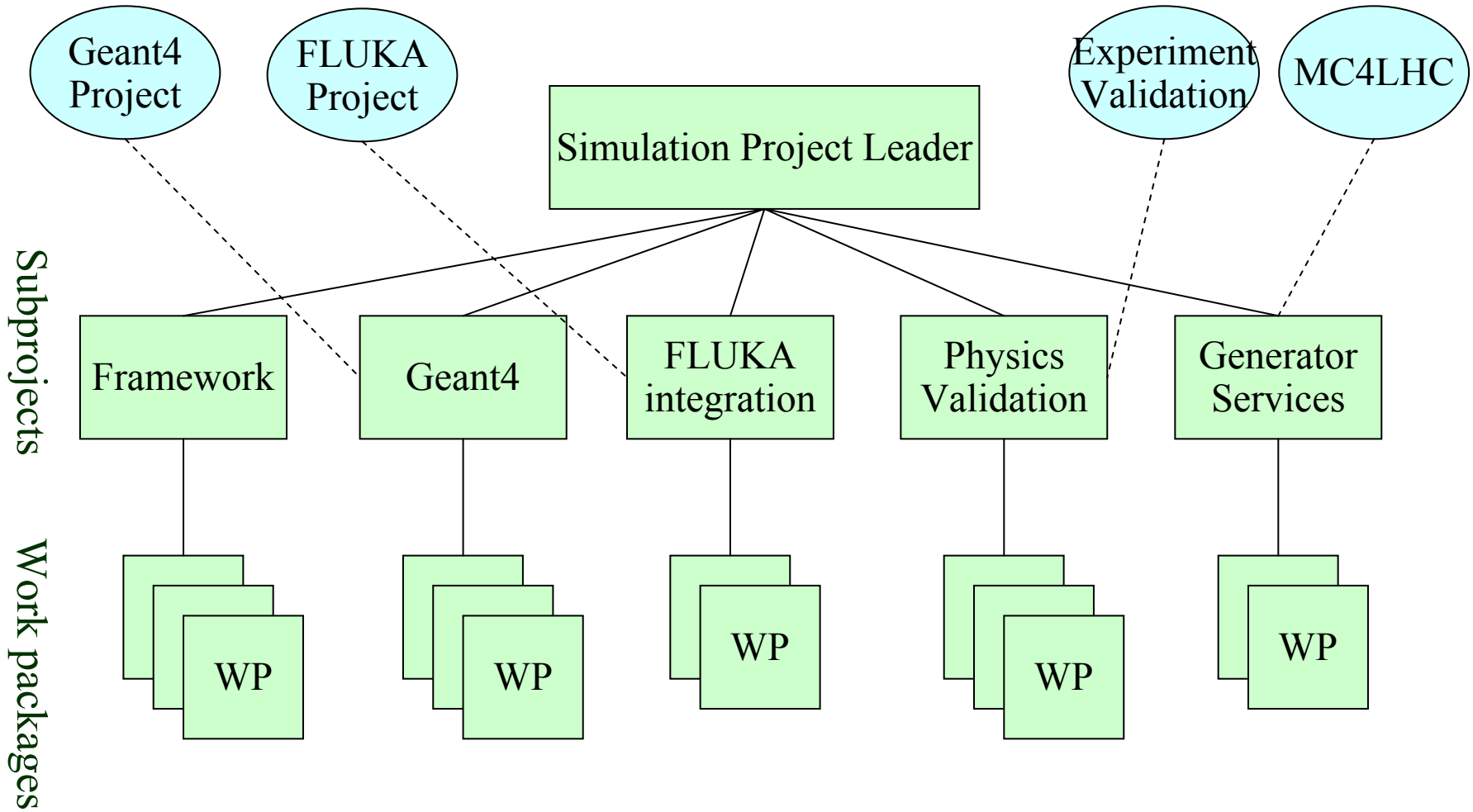
◆ Generator services

Paolo
Bartalini

- ◆ Generator librarian; common event files; validation/test; development when needed



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 lists, with validation from the simulation physics validation subproject
- ◆ Ongoing shift in emphasis from development to production support will continue this year
 - ◆ 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	1.00
G. Folger		0.80		0.20				1.00
G Cosmo	0.50			0.25			0.25	1.00
HP Wellisch		1.00						1.00
I McLaren				0.20	0.50			0.70
V Grichine			1.00					1.00
S Sadilov				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
 - ◆ Results presented in a talk last week
 - ◆ Once finished in a few weeks, will move to a new task TBD
- ◆ Manuel Gallas Teixeira – 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



Generator Services

- ◆ Well advanced on major objective of a generator library – GENSER
 - ◆ ATLAS has migrated to full use of GENSER for DC2, CMS decision for DC05 soon
- ◆ Supports growing list of MC4LHC-mandated generators, including all first-priority ones
 - ◆ List as of mid-April GENSER 0_1_0 release: HERWIG (P.Richardson), PYTHIA (T.Sjöstrand), HIJING (X.N. Wang), ISAJET (F.E. Paige), LHAPDF (M.Whalley), ALPGEN (M.Mangano), COMPHEP (A.Sherstnev), EvtGen (A. Ryd), Glauber Xs (V.Uzhinsky)
 - ◆ 9 generators, 21 versions
- ◆ Common event file production plans advancing well
 - ◆ Event file database MCDB drawing on previous CMS work/experience
 - ◆ Event file format agreed
 - ◆ Identified participants for production development/operations
 - ◆ Leveraging existing (probably CMS) production infrastructure
- ◆ Generator validation in the mandate, but hope to rely mainly on collaboration with the well-supported JetWeb project in the UK
- ◆ Future crucially depends on resolving manpower issues
 - ◆ Project leader – Paolo due to leave end June
 - ◆ Librarian – Stable continuous coverage of the librarian role



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 will come out ~end of April, but some elements already clear
 - ◆ Project is delivering what the experiments need
 - ◆ Urgent manpower issues must be addressed if the project is to be viable
 - ◆ 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 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.



Generator Services Manpower

- ◆ Generator services subproject would not have come into existence without essential manpower coming available:
 - ◆ Paolo as project leader – but scheduled to depart end 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 good user/provider 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



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	lcg:1.1.5.2	10015
2003/12/12	Done v=0	Geant4 release 6.0	lcg:1.1.5.2	10016
2003/12/31	Done v=56	Simulation physics requirements revisited	lcg:1.1.5.4	1.140
2003/12/31	Late	Generic simulation framework prototype available (G4 and FLUKA)	lcg:1.1.5.1	1.144
2003/12/31	Done v=14	Proposal for MCDB deployment in the LCG environment	lcg:1.1.5.6	10017
2004/2/1	Done v=5	LHAPDF generator included in generator library	lcg:1.1.5.6	10018
2004/2/1	Late	First cycle of hadronic physics validation complete	lcg:1.1.5.4	1.145
2004/2/16	Done v=0	SPI-G4 collaborative infrastructure pilot	lcg:1.1.5.2	1.189
2004/3/1	Done v=0	Agreement on formats for event generator common samples	lcg:1.1.5.6	1.197
2004/3/2	Late	Detector description (GDML) proposal to PEB	lcg:1.1.5.1	10014
2004/03/25	Done v=1	Geant4 6.1 release - production improvements	lcg:1.1.5.2	10022
2004/4/1	Late	COMPHEP, ALPGEN and EVTGEN generators included in GENSER	lcg:1.1.5.6	10019
2004/5/31		Review/prioritization of simple benchmarks for simu physics validation	lcg:1.1.5.4	1.213
2004/6/1		Proposal for generator event production environment	lcg:1.1.5.6	10020
2004/6/25		Geant4 6.2 release - resource usage refinements	lcg:1.1.5.2	1.209
2004/7/1		Beta version of MCDB in production in the LCG environment	lcg:1.1.5.6	1.198
2004/7/1		Proposal for an event generator validation framework	lcg:1.1.5.6	10021
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		Geant4 geometry volume registration	lcg:1.1.5.2	10023
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
2004/12/1		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
2004/12/17		Geant4 physics model prototype concluded	lcg:1.1.5.2	10024
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

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>

