QUARTERLY STATUS REPORT				
Project Name			**Date**	
Applications Area			3.6..2008	
Report Period			**Author Name**	
2008Q1			**Pere Mato**	
Milestones for the Quarter			**Status**	**Comments**
SPI				
SPI-13	**31.12.07** **30.04.08** **30.09.08**	Provide an integrated web-based information system about LCG software. This includes information about software dependencies, build information, LCG configurations, then nightly build system, etc.	In test, re-scheduled	The tools for extracting the information of LCG software and displaying the content in a dynamic web page have been developed and tested successfully. Before going into production with the system a few more tests and cleanup of the code have to be done. The system is expected to go online this summer.
SPI-15	**31.03.08** **30.09.08**	Integrate the Geant4 build and test procedure with the LCG AA nightly build system, this will require some adaptation as Geant4 uses different procedures for software check out using tag collectors.	In progress. Rescheduled	The building of geant4 with the LCG/AA nightly build system was integrated successfully. Also the fist tests were adapted, thus providing a proof of concept, that this can be done easily. Nevertheless the whole test suite of geant4 has not been integrated yet. A summer student who will join us in July will be taking over and complete this last step.
ROOT				
ROOT-18	**31.12.07** **30.06.08**	Specifications of the API for the support of complex data schema evolution in ROOT	Done	
ROOT-19	**30.06.08**	Implementation of the complex data schema evolution in ROOT	In progress	
POOL				
POOL-10	**31.03.07** **31.05.07** **30.11.07** **31.03.08**	POOL and CORAL independent from SEAL	Done	The work of removing the SEAL dependencies from POOL is completed. The first configuration LCG_54 with these changes has been recently released and is being integrated by LHCb and ATLAS.
COOL				
COOL-9b	**31.12.06** **31.03.07** **30.06.07** **30.09.07** **31.12.07** **01.04.08** **30.09.08**	Deployment of COOL database services at Tier0 (separate instances for online and offline) and Tier1 for **LHCb** with Streams replication.	In progress. Rescheduled (waiting for the LHCb online RAC).	Still in progress. The delay is due entirely to LHCb.
COOL-12	**31.03.07** **30.06.07** **30.09.07**	SQL query strategy optimizations (mainly for MV data retrieval, but also for other insertion and retrieval use cases).	Done	Completed with version COOL_2_3_1.
COOL-13	**31.03.07** **30.06.07** **30.09.07**	New relational schema with fewer tables.	In progress	
COOL-16	**31.03.07** **30.06.07** **30.03.08**	Move from the SEAL component model to the new CORAL component model.	Done	Since the plan for the migration away from SEAL has changed, the details are different, but the milestone has been reached with COOL 2.5.0 (LCG_55)
SIMU				
SIMU-1	**30.09.05** **15.12.06** **30.03.07** **30.06.07** **01.12.07** **30.04.08**	Apply the Fluka-Geant4 (Flugg) geometry interface to one of the LHC calorimeter test-beam simulation (VD524)	Done	The analysis is completed. Discussion of the results with Fluka and Geant4 experts is undergoing. Final results will be presented at the LCG Physics Validation meeting on February 27th. A written report is in progress. The milestone should be closed.
SIMU-10	**30.06.07** **31.12.07** **31.12.08**	Application of corrections of test-beam data, for validation of stand-alone simulation, to the LHC calorimeter test-beams (VD703)	No progress. On hold.	No progress. Experiments are still working to complete their test-beam analyses.
SIMU-20	**30.11.07**	Review, redesign and debugging of the FLUGG tool (SF711)	On hold	Waiting for manpower.

SIMU-21	**15.12.07** **31.12.08**	Thin-target validations of Geant4 forward physics (G4712)	On hold	Work is suspended, due to lack of manpower in physics validation. Problems exist with acceptance corrections in the published HELIOS data. Awaiting man-power (a fellowship) in order to continue this work. Postponed to December 2008.
SIMU-25	**30.03.08**	4th simple benchmark for Geant4 and Fluka: diffraction of nuclei (VD801)	On hold	Waiting for manpower (see last quarterly report of 2007 for more information).
SIMU-27	**30.04.08**	Status report on comparisons with shower shapes and relevant physics modeling (G4802)	In progress	With the addition of quasi-elastic scattering and the use of the Geant4 QGSP_BERT physics-list, starting with version 8.3, the hadronic shower shape descriptions are now much improved, resolving the issue for the LHC experiments. A short note summarizing this progress is pending and under preparation.
SIMU-28	**30.06.08**	Contributions to expected Geant4 public release (G4803)	Done	Several developments and improvements have been undertaken for the public beta release being prepared for release on July 4th. Developments prepared for 9.2-beta include new processes for hadron Bremsstrahlung and pair production, tuned FTF model for Pi+P interaction and added Fermi momentum to quasi-elastic scattering at high energies (used with QGS/FTF). Included is also the first implementation of the new integrated GDML geometry writer, and completed support in GDML for parameterised volumes and volume properties. External contributors corrected the translation of the INCL Liege cascade code, revised the modeling of the LPM effect for high-energy e- Bremsstrahlung, corrected internal total cross sections in Bertini around 10 GeV, and removed abnormally high pt secondaries from lambdas in high energy parameterized models.
SIMU-30	**15.05.08**	New release process for HepMC defined (GS806)	Done	The new release process for HepMC has been defined and agreed. Milestone to be closed.
SIMU-31	**01.06.08** **31.12.08**	Extend Rivet validation to new C++ generators (GS808)	In progress. Rescheduled.	Some work has started in December with Sherpa, but it is not yet concluded due to problems with Sherpa which were fixed after the GENSER integrator left. The work should resume and be concluded by December 2008.

Summary Of Progress

The Application Area is getting ready for the LHC beam turn on. The major functionality required by the experiments in the initial phase is available and working. Since we can not guarantee that new problems will appear with the new conditions when the experiments will be dealing with real data, we have been improving the software process to have a fast turn around in case we need to produce fixes for the experiments. The new software process relies heavily in the continuous software integration and testing using the nightly build system and an optimized release procedure. We have recently demonstrated that we can produce bug fix releases in less than 24 hours for all supported platforms.

Several LCG software configurations, comprising a coherent set of LCG/AA projects and external software packages have been released. Two major series LCG 54 and LCG 55 have been put into production. The aim of LCG 54 was the usage of the new ROOT production series 5.18, while LCG 55 successfully completed the removal of the SEAL project from the LCG/AA stack. With every new release series the opportunity was taken to upgrade not only the LCG/AA projects but also the external software packages, when needed.

The nightly build system has continued being developed during last quarter. Outsourcing the build instructions to the different projects was completed in the last quarter. This development also allowed other parties to successfully use the nightly build system for their own software testing. Geant4 is and example. LHCb also has adopted the system and adapted it to their specifics needs.

Savannah, the bug tracking system is continuously under high usage by LCG/AA projects, LHC experiments and other parties (e.g. Grid development projects and other CERN/IT groups). One improvement in Savannah was a slight adaptation for the Atlas community allowing them to track bugs of their software projects in a hierarchical manner allowing better inter project relations between the different Savannah project instances. The system continued to have a 100 % availability.

The version of ROOT 5.18 was released on January 15. The coming production release is scheduled for June 25 and includes a long list of new features and improvements. (see release notes at: http://root.cern.ch/root/v51904/Version51904.news.html). Among them there is a re-structuring of the source repository reflecting better the structure of the project in terms of work packages and to easy the maintenance of the release notes and other documentation, a first release of CINT based on Reflex will also be made available for testing in the June release.
The specification of the extended schema evolution functionality requested by the LHC experiments has been produced and agreed. An initial implementation is expected by end of August with a production quality release by the end of the year after having validated by the experiments.

CORAL and POOL have reviewed their database related tests and consolidate the test procedure together with SPI. The common part of the database related set-up has been extracted into a common module which simplifies running all appropriate tests against all available database back-ends. Some remaining configuration steps duplicated into individual test are now done centrally, which simplifies the reconfiguration of the test set-up and now also allows to run database tests in parallel for the different platforms.
A first prototype of the CORAL server has been produced, which handles a significant part of the read-only use cases (including nested queries). This prototype is under test by the ATLAS online developers who contributed a prototype for a caching proxy based on the new CORAL protocol.

A review of the experiment use of POOL components has been initiated to prepare for a cleanup of the Persistency Framework CVS repository from obsolete or unused components. The review did not show any larger unused components at this point. All currently released components are still actively used, but the overlap in the use/dependency matrix between the experiments is at this point limited. We identified some possibility to reduce/avoid the use of the Data Service and the associated pool::Ref smart pointers in ATLAS and CMS, as this is the case already for LHCb. More detailed discussion between POOL and the experiments will follow to plan for further consolidation in this area.

A considerable number of milestones have been achieved in the last quarter by the Simulation Project. Extremely positive feedback has come from LHC experiments now starting to use the latest releases of Geant4 in production; four additional public patches to 8.3, 9.0 and 9.1 releases have been provided, addressing issues reported by experiments.
The leadership of the Generator Services and Simulation Framework has moved from W.Pokorski to A.Ribon, considerably reducing the available manpower for these sub-projects and the Physics Validation. Simulation Framework and Physics Validation have been merged in a single sub-project. In the Physics Validation, the analysis study of Fluka on the ATLAS TileCal 2002 has been completed, showing reasonable agreement with the previous study carried on with Geant4; in addition a new test beam analysis has started, based on the ATLAS HEC setup and is progressing.

The Generator Services sub-project has achieved most of the assigned milestones, providing support and extensions to GENSER, finalising the development for MCDB and bringing its use in production in CMS; a new release and maintenance procedure has been defined for HepMC, leading to new releases achieved in concertation with MC authors, experiments representatives and developers. Concerning the project related to the activation studies in CMS, the PH department and CMS have reached a positive agreement on the use of Fluka for these studies.

Milestones Changes and Actions

References and Hyperlinks

New and Next Quarter Milestones			Status	Comments
POOL-13	**30.06.08**	CORAL server development. COOL read-only tests for selected basic use cases pass	New	
POOL-14	**15.08.08**	CORAL server development. All CORAL integration tests (including write test) pass. This will also require some extension of the current CORAL tests suite to achieve full coverage.	New	
POOL-15	**30.09.08**	CORAL Server scalability and stress tests pass.	New	
POOL-16	**31.10.08**	First CORAL release with full CORAL server support, start of experiment validation	New	
SIMU-34	**30.06.08**	New release of HepMC (2.04) including new handling of units (GS815)	New	2nd level milestone, the new release will include optional handling of units and other minor features
SIMU-35	**1.12.08**	Test of MCDB in CMS large productions	New	

Comments and Additional Information