QUARTERLY STATUS REPORT				
Project Name			**Date**	
Applications Area			09.01.2009	
Report Period			**Author Name**	
2008Q4 (Oct-Dec)			**Pere Mato**	
Milestones for the Quarter			**Status**	**Comments**
SPI				
SPI-16	30.06.08 31.12.08 31.03.09	Deployment of a web content management system, after a quick survey, needed for the restructuring of the SPI web to provide a coherent and complete source of information of all services for users and maintainers.	In progress. Rescheduled.	The amount of data to be migrated has been collected. The decision about the proper content management system was postponed because of the newly created SPI-23 task which took all the resources in this area.
SPI-18	30.09.08 31.03.09	Migration of the current SPI web contents to the newly deployed content management system. This will require the manual inspection and possibly correction, re-writing of the pages.	In progress. Rescheduled.	This milestone depends on SPI-16 which is currently in progress.
SPI-20	31.12.08	Establish the software removal procedure	Completed.	A proposal for the cleanup of LCG/AA software installations has been accepted by the LHC experiments and LCG/AA projects. The first round of actions will be carried out this spring.
SPI-21	31.12.08	Review of the LCGCMT configuration database	Completed.	The proposal for the new structure of LCGCMT has been accepted by the users and was implemented afterwards. It is being used in the "nightly builds" and the first pre-release of the new production series of LCG/AA.
SPI-22	31.12.08 31.03.09	Nightly builds with a "client server architecture"	In progress. Rescheduled.	In order to allow even more dynamic builds of the LCG/AA nightly builds a client-server architecture is envisaged. This will allow "build nodes" to connect to a client which will distribute the builds according to the capabilities of the client.
SPI-23	30.09.08	Migration of the Atlas Hypernews instance to e-groups/sharepoint	New + Finished	IT is providing a new system for mailing lists and email archiving (e-groups + Sharepoint). Hypernews is also a bulleting board system with web and email access. In order to concentrate on a single implementation the Atlas instance of Hypernews has been migrated to e-groups/Sharepoint.
ROOT				
ROOT-16	30.06.07 31.12.07 31.12.08 30.06.09	Cint 7.2 will use Reflex for storing all information regarding types (aka replace the G__struct global array).	In progress. Rescheduled.	CINT7 is fully functional: it passes all of roottest and CINT's test. Nevertheless we reconsidered making CINT7 the default for the December release: it would have risked the stability of a production release that is used by the experiments for an extended period. Interpreting ROOT macros with CINT7 is now between 4 to 10 times slower than with CINT5. We are confident to reduce this slow-down to below a factor 2 and to allow it to be filled from Reflex dictionaries directly (i.e. remove Cintex) until 30.06.2009. We will either reschedule this milestone or remove it, depending on the 21.01.2009 Architects Forum's decision regarding an
ROOT-19	30.06.08 31.12.08	Implementation of the complex data schema evolution in ROOT	Achieved.	The new automatic schema evolution has been introduced in the version 5.22 released last December.
ROOT-22	31.12.08 31.01.09	Restructuring of the ROOT web site and documentation system.	In progress. Rescheduled.	Last quarter's main item of work has been on the new Drupal based web site that is expected to go live at the end of January 2009.
ROOT-23	31.12.08	Implementation of PROOF optimized to run locally on multi-core platforms (PROOF-lite).	Achieved	The first version of PROOF-Lite, a version optimized for multi-core desktop has been released as part of version 5.22 of ROOT.
POOL				
POOL-13	30.06.08 31.12.08	CORAL server development. COOL read-only tests for selected basic use cases pass	Included in POOL-16. *Removed.*	This milestone has been included in POOL-16 (release of CORAL server with read-only functionality) and removed.
POOL-14	15.08.08 31.04.09	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.	Included in POOL-17. *Removed.*	This milestone has been included in POOL-17 (release of CORAL server with update functionality) and removed.

POOL-15	30.09.08 31.12.08 31.03.09	CORAL Server (read-only) scalability and stress tests pass. Validation using the Atlas HLT tests.	Rescheduled.	This milestone has been reduced in scope to stress tests of the read-only functionality. Performance should fully satisfy the requirements of the Atlas HLT team. Rescheduled (waiting for POOL-16).
POOL-16	31.10.08 31.12.08 31.03.09	First CORAL release with read-only CORAL server support. COOL and CORAL read-ony tests pass. Start of experiment validation.	Rescheduled.	This milestone has been reduced in scope to the release of the read-only functionality. The releases of more complete CORAL server software with secure authentication and full write functionalities have been rescheduled as milestones POOL-17 and POOL-18. Progress has been slow. An internal review of the software has been held in December 2008, leading to a new architecture design that is expected to speed up development (when resources are again available after the LCG_56 release).
POOL-17	31.10.08 30.04.09	Release of CORAL Server with secure authentication. All functional tests pass.	Rescheduled.	This is a rescheduled milestone, previously expected for October 2008 as part of POOL-16.
POOL-18	31.10.08 30.04.09	Release of CORAL Server with full write functionality (DML and DDL). All functional tests pass.	Rescheduled.	This is a rescheduled milestone previously expected for October 2008 as part of POOL-16.
POOL-19	31.12.08	CORAL support for gcc4.3.	Ready for release.	The CORAL port to gcc4.3 was completed in Q4 2008 and is ready to be released in LCG56. This required several API changes ('const int f()' -> 'int f()') to fully comply with the gcc4.3 standard.
POOL-20	31.12.08	POOL support for gcc4.3.	Partially completed. Ready for release.	The POOL port to gcc4.3 was partially completed in Q4 2008 and is ready to be released in LCG56. The API and implementation changes ('const int f()' -> 'int f()') required to fully comply with the gcc4.3 standard still need to be prepared. This results in build warnings, but the full POOL functionality is available.
POOL-21	31.12.08	CORAL support for MS VC9.	Ready for release.	The CORAL port to VC9 has been completed in January 2009 and is ready to be released in LCG56.
POOL-22	31.12.08	POOL support for MS VC9.	In progress.	The POOL port to VC9 has just started because the VC9 build of CORAL was not available in the nightlies until January 2009.
		COOL		
COOL-14	31.03.07 30.06.07 30.11.08	Support for simple payload queries (lookup of IOVs by payload data).	Completed.	The implementation of payload queries will be based on the new record and field interfaces described in milestone COOL-7 and released in COOL 2.0.0 (January 2007). This milestone was resumed in Q3 2008 after being removed in Q2 2007. The new API and its implementation were released in COOL 2.6.0 (November 2008).
COOL-25	30.09.08 30.11.08	Implement a 'partial' tag locking mechanism.	Completed.	Partial' tag locking is meant to prevent the removal but allow the addition of new IOVs or HVS nodes to partially locked tags. The generic API for partial tag locking, and its implementation for the additions of new HVS tags, have been completed in COOL 2.3.0 (January 2008). The functionality to allow also the addition of IOVs to partially locked tags was completed in Q3 2008 and released in COOL 2.6.0 (November 2008).
COOL-26	30.09.08 31.12.08	Support for the gcc4 compiler on Linux.	Ready to be released.	The port of the COOL code and configuration to support gcc4.1 has been completed in COOL 2.3.0 (January 2008). This is not an officially supported platform - it is expected that only gcc4.3 will be supported in the LCG AA. The port of the COOL code to gcc4.3 started in October 2008 and was completed in Q4 2008. This required several API changes ('const int f()' -> 'int f()') to fully comply with the gcc4.3 standard, stricter than the gcc4.1 standard. COOL is ready to be released for gcc4.3 in the upcoming COOL 2.7.0 (January 2009), also thanks to the completion of the CORAL port (POOL-19).
COOL-28	30.09.08 31.12.08 31.03.09	Support for the 'CORAL server' backend.	Rescheduled.	Support for 'coral://' URLs was first prototyped in COOL 2.4.0 (February 2008), allowing simple tests against early prototypes of the CORAL server and the definition of additional constraints on its development for its integration into COOL. The COOL read-only tests are now routinely used to validate the CORAL server implementation (POOL-13). Full support in COOL depends on the release of the CORAL server (POOL-16).
COOL-29	30.09.08 31.12.08 31.03.09	Expose transaction management in the user API.	In progress. Rescheduled.	Prototypes of the API and implementation are ready to be internally reviewed for inclusion in one of the upcoming COOL releases. This task was postponed due to more urgent priorities for the COOL 2.7.0 release in early February 2009 (new versions of ROOT and other externals, support for new platforms).

COOL-30	30.09.08 31.12.08 31.03.09	Allow session sharing in the user API.	Rescheduled.	This milestone depends on transaction management (COOL-29).
COOL-31	31.12.08	Reimplement and optimize all SQL queries for IOV retrieval by time, reusing the same C++ methods for different SV and MV use cases.	Completed.	The SQL queries needed to handle the various COOL use cases (SV, MV tags, MV user tags, MV HEAD...) were originally defined in separate C++ methods, added over time. In order to allow the future maintenance of the software and further performance optimizations, these pieces of code need to be merged together. Some improvements in this direction were added in the COOL 2.3.1 release (February 2008): the same code is used for IOV retrieval from MV tags and MV user tags. This has allowed the simultaneous performance optimizations of IOV retrieval from MV tags, and IOV insertion with MV user tags. Additional improvements were then added in COOL 2.5.0 (June 2008) to reuse the same code also for some SV and MV 'head' queries. The major internal refactoring and cleanup that are necessary to achieve this task were finally prepared during Q3 2008. The code was released in COOL 2.6.0 (November 2008).
COOL-32	30.11.08	Implement the 'tag cloning' functionality.	Completed.	This functionality has been requested by LHCb. Its implementation was completed during Q3 2008 and was released in COOL 2.6.0 (November 2008).
COOL-33	30.11.08	Avoid unnecessary COUNT(*) queries in IOV retrieval.	Completed.	This performance optimization has been requested by Atlas as a result of their distributed stress tests in Q3 2008. Its implementation was completed and released in COOL 2.6.0 (November 2008). The size of IOV iterators is now computed only on demand, avoiding unnecessary COUNT(*) queries against the database server.
COOL-34	31.12.08	Support for MS VC9.	Ready to be partially released.	A significant effort was spent during Q3 2008 on the port of the COOL code and configuration to support the Microsoft Visual Studio Express 2008 (VC9) compiler. In cooperation with the SPI and ROOT teams, this resulted on good progress also in fixing several issues with gccxml, ROOT and LCGCMT. COOL could be fully built by November 2008 but several issues still existed at runtime during tests. Thanks mainly to the completion of the CORAL port to VC9 (POOL-21) and the rebuilding of several external packages using VC9, the COOL C++ libraries are ready to be released with full support for VC9 in the upcoming COOL 2.7.0 (February 2009). The only pending problem is PyCool, which cannot be loaded at runtime: it is expected that solving this issue will require the rebuilding of Python using VC9 (presently a Python executable built on VC7 is used with the COOL VC9 libraries).
SIMU				
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	Partially done. An important bug fix was recently provided, enabling to use FLUGG with the latest version of Geant4. A general code review has not been done due to lack of 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	After first Geant4 results, also some preliminary Fluka results have been compared with data. After discussions with Fluka experts, it has been agreed that the data needs further investigation since the original analysis was based on some old, wrong assumptions. Furthermore, proton-proton data is considered important for a more complete investigation of the diffraction, therefore requiring additional analysis. The activity has been postponed, pending the assignment of new manpower.
SIMU-27	30.04.08	Status report on comparisons with shower shapes and relevant physics modeling (G4802)	Achieved	Delivered on November 21st, 2008; ref.: CERN-LCGAPP-2008-01.
SIMU-29	30.09.08	Fluka extension to the ATLAS HEC test-beam analysis (VD804)	On hold	Waiting for manpower. A non trivial bug in FLUGG prevents any progress. A review of the FLUGG tool is required, as expressed in milestone SF711.

SIMU-31	01.06.08 31.12.08 30.06.09	Extend Rivet validation to new C++ generators (GS808)	On hold	No progress, due to lack of manpower. However, Rivet is under evaluation also for regression testing. Rescheduled to June 2009
SIMU-32	15.09.08	First version of System Integration Testing of Geant4 running on SPI-nightly platform (G4811)	Achieved	Level-2 milestone. Provide migrated test suite for integration in the SPI-nightly facility.
SIMU-34	30.06.08	New release of HepMC (2.04) including new handling of units (GS815)	Achieved	2nd level milestone, the new release will include optional handling of units and other minor features
SIMU-35	1.12.08 30.06.09	Test of MCDB in CMS large productions (GS817)	In progress. Rescheduled.	Expected to be completed by June 2009.
SIMU-36	15.12.08	Contributions to Geant4 release of December 2008, including improvements in hadronic models (G4812)	Achieved	Release 9.2 of Geant4 delivered on schedule. Among all features, it included re-tuning of FTF hadronic models, fixes to Bertini, Binary and pre-compound hadronic models. Fixes to technical issues uncovered by the regular and large-scale grid testing.

Summary Of Progress

Due to the incident of LHC we started to prepare and validate the new set of releases to be used for 2009 running during the last quarter. This new software stack is going to be finalized and released at the end of January, with sufficient time for the experiments to adapt to it and validate before data taking is resumed. Following there ia more detailed summary of the progress of the various AA projects.

In the last quarter SPI was working actively in two major areas: porting the complete software stack to new operating systems and compilers and the migration of the Hypernews instance used by the Atlas collaboration to the newly provided IT managed e-groups/Sharepoint discussion fora.

A new major LCG configuration has been prepared for 2009 running period. It includes the transition between to major SLC Linux platforms (slc4 and slc5) using different gcc compilers (gcc 3.4 and gcc 4.3) and two Windows compilers (VC 7.1 and VC9). In total up to 20 different platforms (combinations OS compiler version) has been requested by the LHC experiments through the Architects Forum. In order to ease the preparation of these new platforms a script for the automatic recompilation of the external area on new compilers has been prepared and deployed. A first LCG pre-release of the new configuration has been successfully prepared and is currently used by LHC experiments for their integration testing.

The Atlas collaboration has decided to move their discussion and bulletin board system from the currently used Hypernews system to the newly developed e-groups/Sharepoint system provided by IT. In order to migrate the current content of Hypernews into the new system a major effort has been done by SPI in order to automate the move of the information (more than 200 fora and 120.000 messages). In collaboration with the relevant IT groups a migration strategy and tools for this migration have been developed. The migration of the actual system took place on Mon. Jan 19th and went without problems.

The new ROOT version 5.22 has been released in December. This new version is a consolidation of the system to be ready for the LHC data taking. The full release notes can be seen at : http://root.cern.ch/root/v522/Version522.news.html

For what concerns the infrastructure the main item of work has been on the new Drupal based web site that is expected to go live at the end of January 2009. Another major milestone that has been achieved has been the introduction of an automatic schema evolution system allowing to read in the same job files produced with different versions of the user classes. The I/O performance has also been improved for the most usual cases involving standard STL collections.

Other important developments in the area of Math libraries are the new implementations for fitting and an updated version of the GUI fit editor with increased robustness and providing additional functionality, support for parallelization using multi-threads has been added to the Minuit minimization algorithm, a first version of the RooStats package that provides the high level tools for performing statistical calculation such as interval estimation or hypothesis testing developed in close collaboration with the LHC experiments.

In the GUI and 2-D/3-D graphics area many components has been consolidated and the documentation has been improved. It is worth to mention the new ROOT event recorder that has been implemented, offering a powerful tool to perform Quality Assurance and allowing to create self-playing tutorials. A window manager for the EVE (Event Display classes) has been also implemented, allowing arbitrary placement and aggregation of all GUI windows.

For PROOF the main development activities during this quarter have been the commissioning of the new XROOTD PROOF plugin for the latest ROOT production release; the delivery of the first version of PROOF-Lite, a version optimized for multi-core desktops; kernel consolidation; the import of the latest version of XROOTD in ROOT.

The Persistency Framework projects have had new releases with functionality and performance enhancements in the "de-SEALed" LCG_55 release series. The SEAL based configurations have finally been abandoned during Q4 2008. More recently, fewer feature enhancements have been possible as a large effort has been spent in all projects to prepare for the upcoming LCG_56 release (expected in early February 2009), involving major upgrades in the ROOT, Boost and CMT versions, a new CMT tag policy, and support for several new platforms such as the gcc4.3 compiler on Linux, the VC9 compiler on Windows, and the SLC5 Linux operating system.

An internal review of the CORAL server software has been held in December 2008, leading to a new architecture design that is expected to speed up the development progress (when resources are again available after the LCG_56 release). The PF projects are currently facing a temporary manpower shortage due to the departure of several developers.

The main achievement for the Simulation Project has been the delivery of the new public release of Geant4, Geant4 9.2 in December. The new release provides among all features the final implementation of the Liege Cascade hadronic model; improvements to Bertini Cascade (contribution from CMS and FNAL leading up to 25% speedup for physics lists including Bertini) and fixes for Bertini quasi-elastic; re-tune of FTF hadronic model; complete GDML plugin for reading and writing and import of CAD STEP-tools files; new module for detector description in ASCII text format; update to PDG-2008 for particles masses and widths.

Technical work has been carried out in GENSER for migrating the build system of major generators to use 'autotools'; new versions of the generators have been introduced as usual.

A first working prototype has been developed for using Geant4 in conjunction with Garfield for gas-detector calculations, in view to realise a more stable and complete interface.

A critical shortage of manpower due to the unexpected departure of a key player in June 2009, is now endangering the whole Simulation Project. If no corrective actions will be taken, a good portion of the current activities undertaken by the LCG Simulation Project (Generator Services, Physics Validation) will have to be withdrawn and eventually assigned to external sources.

Issues During the Quarter

References and Hyperlinks

New and Next Quarter Milestones			**Status**	**Comments**
SPI-18	**30.09.08** **31.03.09**	Migration of the current SPI web contents to the newly deployed content management system. This will require the manual inspection and possibly correction, re-writing of the pages.	In progress. Rescheduled.	This milestone depends on SPI-16 which is currently in progress.
SPI-24	**31.03.09**	Automatic external s/w stack rebuild	In progress.	The LCG/AA sofware stack is permanently adapted to new compilers, operating systems, architectures. Every time such a change happens all the external software packages need to be recompiled. With the newly introduced "Builder" system this can be done easy on a package per package basis. A tool on top of this system should allow further automatization and ease the recompilation of all software packages in one go.
COOL-35	**30.06.09**	Migration from CVS to SVN.	New.	
COOL-36	**28.02.09**	Support for Linux SLC5.	New. Ready to be partially released.	The port of COOL and all other PF projects to SLC5 has been relatively smooth, involving only few configuration changes. COOL is partially ready to be released on SLC5 in the upcoming COOL 2.7.0 (February 2009), with the notable exception that support for Oracle cannot yet be provided. This is due to the incompatibility of the Oracle client libraries and SELinux. This issue is being followed up by CERN IT with Oracle Support.
SIMU-37	**30.04.09**	Prepare the migration to SLC5 and gcc-4.3.2 in GENSER (GS902)	New	2nd level milestone. Test generators with gcc-4.3.2 and associated gfortran in GENSER on SLC5
SIMU-38	**1.06.09**	Evaluation of Rivet and HepMC Analysis Tool for regression testing based on distributions (GS905)	New	2nd level milestone. Finalise evaluation of Rivet and HepMC Analysis Tool for generators validation
SIMU-39	**1.06.09**	New HepMC release 2.05 (GS906)	New	2nd level milestone. New release based on agreed features to be added

Comments and Additional Information