QUARTERLY STATUS REPORT				
Project Name			**Date**	
Applications Area			30.06.2009	
Report Period			**Author Name**	
2009Q2			**Pere Mato**	
Milestones for the Quarter			**Status**	**Comments**
SPI				
SPI-18	**30.09.08** **31.03.09** **30.06.09** **30.09.09**	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.	First parts of the SPI web are currently being fed into the new Drupal web page infrastructure.
SPI-25	**30.06.09**	Migration of more Hypernews instances into Sharepoint	Completed	The instances of LHCb, Alice and LCG Applications Area have been migrated to the new IT provided e-groups/Sharepoint system. A meeting was held with admins of the remaining CMS and Totem instances who are not migrating by now. A schedule for the handover of the system has been agreed on.
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).	Completed	CINT7 is fully functional: it passes all of roottest and CINT's test. Nevertheless we reconsidered making CINT7 the default for the December release. Testing CINT7 with the CMS framework has started and is ongoing. (see new ROOT-26)
POOL				
POOL-15	**30.09.08** **31.12.08** **31.03.09** **30.06.09** **30.09.09**	CORAL Server (read-only) scalability and stress tests pass. Validation using the Atlas HLT tests.	In progress. Rescheduled.	This milestone has been reduced in scope to tests of the read-only functionality and performance required by the Atlas HLT team. Good progress has been achieved in both areas using the new implementation developed in 2009. The software now passes the basic functionality tests against all three Oracle databases relevant to the Atlas HLT use case: COOL (achieved in Q1), as well as geometry and trigger data (achieved in Q2). The development and testing process was greatly improved in Q2 2009 when our Atlas-HLT collaborators developed a standalone Athena HLT test that could be executed also by the non-Atlas members of the team. This test is being used extensively for functional debugging, but also for measuring and reducing the performance overhead of running through a CORAL server rather than connecting directly to Oracle. During Q3, the software will be installed in the Atlas control room to perform more complete and realistic tests of functionality and performance for the HLT use case, including the validation of the data quality of the software chain for physics processing.
POOL-16	**31.10.08** **31.12.08** **31.03.09** **30.06.09**	First CORAL release with read-only CORAL server support. COOL and CORAL read-only tests pass. Start of experiment validation.	Completed	This milestone, previously expected for October 2008, has been reduced in scope to the release of the read-only functionality. Progress was slow in 2008. An internal review of the software was held in December 2008, leading to a new architecture design. This has significantly sped up the progress of development in 2009, which restarted in Q1 when resources were freed after the LCG_56 release. An implementation with read-only functionalities was completed and passed COOL and CORAL read-only tests by the end of Q1. During Q2 2009, the software was further improved with several fixes and enhancements, until it successfully passed the basic functionality tests against the COOL, geometry and trigger databases relevant to the Atlas HLT use case. This version of the software has been released in CORAL 2.3.1 (June 2009) and will now be installed in the Atlas control room for more complete performance and functionality tests of the HLT use case (POOL-15). A locking issue when Oracle connection sharing is enabled has been observed during the tests. Its resolution has been rescheduled as a separate milestone POOL-24.
COOL				

COOL-28	**30.09.08** **31.12.08** **31.03.09** **30.06.09**	Support for the 'CORAL server' backend.	Completed.	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. Since then, the COOL read-only tests have been routinely used to validate the CORAL server implementation (POOL-13). Full support for this new backend has been achieved in COOL 2.8.1 (June 2009) thanks to the first release of the CORAL server in CORAL 2.3.1 (POOL-16).
COOL-35	**30.06.09** **30.12.09**	Migration from CVS to SVN.	Rescheduled.	This task has now a lower priority and has been rescheduled because the CVS service will be maintained until all experiments have migrated to SVN, which is not expected to happen before the winter 2009-2010 shutdown.
COOL-37	**30.10.09**	Full support for Oracle on Linux SLC5.	In progress.	For the time being, support for Oracle on SLC5 can only be provided if a special installation procedure is used to bypass the SELinux security constraints for the Oracle client libraries. This is due to known incompatibilities of these libraries and SELinux, which are being followed up by the PF team with Oracle Support. The issue is expected to be fully resolved by the upgrade to the upcoming Oracle 11.2 client libraries in Q3 or Q4 2009.
COOL-38	**31.05.09**	New relational schema with a separate payload table.	New. Completed.	Support for a new relational schema offering the option to store conditions data payload in a separate payload table has been implemented in COOL 2.8.0 (May 2009), following a request from ATLAS. This option can be especially useful for avoiding the duplication of large payload in MV folders. It is only available for new folders, as the implementation of schema evolution tools has not been requested.
SIMU				
SIMU-10	**30.06.07** **31.12.07** **31.12.08** **30.09.09**	Application of corrections of test-beam data, for validation of stand-alone simulation, to the LHC calorimeter test-beams (VD703)	No progress. On hold.	Experiments are still working to complete their test-beam analyses. The delay in this milestone is compensated by the prompt feedback on new versions of Geant4 that different test-beam groups (in particular by ATLAS HEC, ATLAS TileCal, ATLAS CTB, and CMS HCAL) are providing to the developers.
SIMU-25	**30.03.08** **31.03.09** **31.03.10**	4th simple benchmark for Geant4 and Fluka: diffraction of nuclei (VD801)	On hold. Rescheduled.	Waiting for the new fellowship to start on July 1st. Milestone to be rescheduled for March 2010.
SIMU-31	**01.06.08** **31.12.08** **30.06.09** **01.06.10**	Extend Rivet validation to new C++ generators (GS808)	On hold. Rescheduled.	Given the current man-power and the need to complete the migration to 'autotools' for all generators, the milestone should be rescheduled for June 2010.
SIMU-35	**1.12.08** **30.06.09**	Test of MCDB in CMS large productions (GS817)	Completed	CMS is using MCDB for their production, allowing for the storage of intermediate parton-level files, in Les Houches Event Format. The milestone can be closed, and a new one is proposed below.
SIMU-37	**30.04.09** **31.07.09**	Prepare the migration to SLC5 and gcc-4.3.2 in GENSER (GS902)	In progress.	Most of the generators have been migrated to SLC5, on both 32 and 64-bit architectures. Work is in progress to complete the migration for all generators. The milestone is rescheduled to end July 2009.
SIMU-38	**1.06.09**	Evaluation of Rivet and HepMC Analysis Tool for regression testing based on distributions (GS905)	Partially completed	The HepMC Analysis Tool has been installed in the GENSER area and can be used to complement the tests that are routinely run at each new release. The evaluation of Rivet for regression testing is still missing. The milestone is closed and a new one for Rivet created.
SIMU-39	**1.06.09**	New HepMC release 2.05 (GS906)	Completed	Released. Among the features included: the generated cross section may optionally be stored in GenCrossSection on an event by event basis; new GenEvent streaming input and output operators; possibility to specify output precision; ASCII input dealing gracefully with corrupt data; new convenience methods in GenParticle.

Summary Of Progress

The SPI project has been continuing on the development of the nightly build system, including further improvements on multi core build architectures and replacing the current web infrastructure by a database system. Two LCG Configurations LCG 56a and 56b have been released on request of the LHC experiments. The investigations about the new web pages infrastructure have been finished and a first prototype which should suit the projects and R&D projects in the group will be presented in the coming days.

The new ROOT production release 5.24 contains several improvements in the ROOT mathematical libraries. The core libraries have been consolidated with small improvements and bug fixes, thanks to the effort put in developing new test programs. The major new developments have been put in libraries like RooFit, RooStats and TMVA.
The maintenance of the dictionary generators genreflex and rootcint, of ROOT's interpreter CINT, and of the reflection database Reflex was again a main task of the last quarter. Testing CINT7 with the CMS framework has started and is ongoing.
The last months have seen a constantly increasing number of groups testing PROOF, with a consequent introduction of several new use-cases and the request for new or improved functionality. The main development activities focused on the consolidation of the XROOTD PROOF plug-in and to the improvement of the user interface. Several bugs have been uncovered and fixed.
The newly introduced ROOT event recorder has been improved, allowing more flexibility in the session recording/replaying. The GUI and OpenGL deve

For the Simulation project the main achievement has been the delivery of the new public Beta release of Geant4, Geant4 9.3-beta, announced in early June as planned. The new release provides to experiments a preview of some new features and physics configurations to test and attempting to improve the smoothing in energy response in the transition region between the different hadronic models.
The migration to gcc-4.3.2 has been completed for most generators in GENSER; also, adoption of 'autotools' for building packages in GENSER has been endorsed; a new HepMC version (2.05) has been released, now providing the possibility to store generated cross section on an event by event basis, and improvements to the I/O streaming. Progress has been made in unifying EvtGen and a new version of the package is expected soon.

New versions of CORAL, COOL and POOL have been released in Q2 2009 against the external dependencies defined by the two new configurations LCG_56a (April 2009) and LCG_56b (June 2009). The main achievement of PF development during this quarter has been the first release of the CORAL server components with read-only functionalities, which passed the first offline validation tests for the Atlas HLT use case and will now be tested more extensively in the experiment control room. An enhanced version supporting secue authentication using Grid certificates and VOMS authorization is undergoing some final tests and configuration fixes and will be included in an upcoming release. New features have also been added to POOL (improved collections) and COOL (new relational schema supporting conditions data payload stored in a different table from IOV metadata).
The migration from CVS to SVN has been postponed as the external pressure to complete this task has decreased.

Issues During the Quarter

Milestones Changes and Actions

References and Hyperlinks

New and Next Quarter Milestones			Status	Comments
ROOT-24	**31.12.09**	Implement automatic test suites for fitting histograms, graphs and trees.	New	Implement automatic test suites for fitting histograms, graphs and trees with all the possible available options, for numerical algorithms operating on ROOT function classes and for toy MC generation
ROOT-25	**31.12.09**	Provide implementations in RooStats for hypothesis tests and interval estimation with various techniques	New	Provide implementations in RooStats for hypothesis tests and interval estimation with various techniques: full frequentist via Neyman construction, profile likelihood method, hybrid frequentist-bayesian method and full bayesian.
ROOT-26	**31.12.09**	Testing CINT7 with CMS Framework	New	CINT7 is currently under scrutiny building the full CMS framework with a CINT7-enabled ROOT. It is making use of one of the fundamental ingredients of this milestone: genreflex-generated dictionaries fill the CINT dictionaries directly; libCintex is unused. Many problems have been found and fixed (also in the CMS code). The future of this milestone depends on the progress and result of this study with CMS.
ROOT-27	**31.12.09**	Implement delayed loading for genreflex dictionaries	New	Delayed loading for genreflex generated dictionaries. This will reduce the dictionaries' memory cost for Atlas, CMS, and LHCb, and it will reduce the startup time of their binaries.
ROOT-28	**31.12.09**	Implement a a better PROOF benchmark suite to measure real performance	New	The improved benchmark suite will measure the real performance of the available storage systems and give indications on the better configuration options for PROOF, e.g. optimal number of workers per session and the best packetizer parameters.
ROOT-29	**31.12.09**	PROOF dynamic parallel merging	New	Parallel merging with dynamically determined submergers. The optimal number of submergers will be determined from the size and composition of the output list. The first idle workers will be promoted submergers and and asked to merge the results of a set of other workers. Final merging will be done by the master.
ROOT-30	**31.12.09**	PROOF worker auto-discovery using bonjour/avahi	New	Using bonjour/avahi service discovery technology it is possible to eliminate the need for the proof.conf file with static information about the available worker machines.

ROOT-31	**31.12.09**	Implementation of 2D graphics entirely based on OpenGL	New	A first version of 2D graphics entirely based on OpenGL is being implemented. Also based on OpenGL, techniques allowing 5D data set representations are under development. We expect to provide a first implementation of a GL-based pad rendering in time for the next production release.
ROOT-32	**31.12.09**	Interfacing the Pad-GL to the 3-D GL viewer	New	The Pad-GL developments must be interfaced to the 3-D GL viewer and EVE packages. It should be possible to insert 1-d, 2-d, 3-d histograms or any 2-D graphics in a GL scene.
ROOT-33	**31.12.09**	Implementation of an interface for the "graphviz" package	New	An interface to the "graphviz" package: http://www.graphviz.org/ will be implemented. graphviz is already used (via a shell-script interface) to visualize dependencies in the html generated documentation. graphviz is the standard graph-dependency visualization tool used by many open source projects (eg kcachegrind). The new interface class will make use of the existing C-API in this package. This class will be used by several ROOT monitoring tools currently under development and also by RooFit and Roostats.
ROOT-34	**31.12.09**	Finalization and consolidatiuon of the Event Recorder	New	Finalize/consolidate Event Recorder: - Fixing remaining issues (e.g. problem of window registration with very complex GUIs like fit panel, not working with GUI Builder, ...) - Making it more cross-platform reliable (it is now dependent on OS &
ROOT-35	**31.12.09**	Consolidation of the GUI builder	New	The ROOT GUI builder has to be consolidated, many widgets have to be added. Even if we don't provide the full set of existing widgets, the ROOT GUI builder must be able to save and load GUI macros without any crash.
SIMU-40	**19.12.09**	Contributions to the December 2009 public release of Geant4 (G4908)	In progress	Developments scheduled for the public release of December 2009 include: improvements to the QGS hadronic model fragmentation; the extension and tuning of the CHIPS model for hadron-nucleus collisions up to 100 GeV; a review of the internal cross section in binary cascade and QGS model; a review of physics models to identify and fix cases of event irreproducibility; tuned model of fluctuations for ion ionisation; prototype for applying strict production thresholds for EM particles per geometrical regions; improvement of the Spline interpolation for physics vectors; the extension of geometrical regions to local magnetic fields; improved implementation of selected CGS shapes; interface for computing isotropic safety and geometry step for multiple and single scattering.
SIMU-20	**30.11.07** **30.11.09**	Review, redesign and debugging of the FLUGG tool (SF711)	In progress. Rescheduled.	The technical student G.Camellini is working on FLUGG, using the ATLAS HEC test-beam setup. Some progress has been made and issues fixed: the application which was previously manifesting problems now runs for longer, still under debugging.
SIMU-21	**15.12.07** **31.12.08** **15.03.10**	Thin-target validations of Geant4 forward physics (G4712)	On hold. Rescheduled.	Remains limited by the lack of manpower, which was exacerbated by the extra duty of Alberto Ribon to lead the GENSER project in 2008. The new fellow, who will start working on July 1st, is expected to contribute to the forward physics validation of Geant4. Being rescheduled to March 2010.
SIMU-41	**01.12.09**	Complete build of all versions of generators with 'autotools' (GS911)	New	2nd level milestone
SIMU-42	**01.12.09**	Support MCDB for CMS productions (GS912)	New	2nd level milestone
SIMU-43	**01.12.09**	Evaluation of Rivet for regression testing based on distributions (GS913)	New	2nd level milestone
SPI-26	**30.09.09**	Infrastructure setup for Drupal web pages	In progress.	A first prototype of the drupal based web infrastructure has been setup and will be presented in the forthcoming group meeting. If a general agreement on the deployment can be reached this system shall go into production.
SPI-27	**30.09.09**	Code coverage testing for nightly builds	In progress.	The summer student joining the SPI team has already started to work on the topic.
SPI-28	**30.09.09**	Database infrastructure for nightly builds	New	In order to facilitate the handling of the results of the nightly build system, the current file based infrastructure will be replaced by a database.

POOL-17	**31.10.08** **30.04.09** **30.07.09**	Release of CORAL Server with secure authentication. All functional tests pass.	In progress.	This is a rescheduled milestone, previously expected for October 2008 as part of POOL-16. A first implementation of secure data transmission and grid certificate authentication using VOMS and ssl was prepared in Q1 2009, using the new design for component architecture. During Q2, the implementation was completed with the addition of VOMS-based authorization, of a tool for maintaining a list of connections and credentials, and of a more complete test suite. The package has not yet been released because its external dependencies and integration with LCGCMT still need to be finalised in the wider context of LCG AA dependencies on Grid packages. The CORAL server software was developed and tested (on SLC4 and SLC5) using a 1.9 VOMS package that uses the system version of ssl and does not depend on Globus. However, this may lead to incompatibilities with other Grid packages (like gfal) that on SLC4 can only be supported using the Globus version of ssl. It is likely that the secure CORAL server will be released during Q3, either only on SLC5 using the no-Globus VOMS, or also on SLC4 using the Globus-based VOMS.
POOL-18	**31.10.08** **30.04.09** **30.09.09**	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-23	**30.06.09** **30.09.09**	Remove gcc4.3 build warnings for POOL.	Renamed. Rescheduled.	This is a rescheduled milestone, previously included in POOL-20. Some implementation changes in POOL are still required to get rid of a few pending build warnings caused by the stricter gcc4.3 standard. This task has been renamed because, in contrast to what was incorrectly claimed in the Q1 2009 report, no change is likely to be required in the public POOL API.
POOL-24	**30.09.09**	Full support for Oracle connection sharing in the CORAL server	New.	This is a rescheduled milestone, previously included in POOL-16. Complete support for Oracle connection sharing is needed to fully exploit the multiplexing capabilities of the CORAL server in the absence of an intermediate caching proxy. To achieve this, the locking issues observed in the Oracle plugin when connection sharing is enabled must be addressed
POOL-25	**30.09.09**	Performance optimizations in the CORAL LFC replica service.	New.	Peformance issues with the LFC replica service have been observed by LHCb during Q2 2009. Some changes to the CORAL implementation are necessary to fix these issues.
POOL-26	**31.10.09**	Monitoring tools for the CORAL server and CORAL server proxy.	New.	
COOL-29	**30.09.08** **31.12.08** **31.03.09** **30.09.09**	Expose transaction management in the user API.	In progress. Rescheduled.	Prototypes of the API and implementation have been prepared in Q4 2008 and are ready to be internally reviewed for inclusion in one of the upcoming COOL releases. This task has been postponed due to more urgent priorities for the PF (new platforms and externals in Q1 2009, CORAL server developments in Q2 2009).
COOL-30	**30.09.08** **31.12.08** **31.03.09** **30.09.09**	Allow session sharing in the user API.	Rescheduled. Depends on COOL-29.	This milestone depends on transaction management (COOL-29).
COOL-35	**30.06.09** **30.12.09**	Migration from CVS to SVN.	Rescheduled.	This task has now a lower priority and has been rescheduled because the CVS service will be maintained until all experiments have migrated to SVN, which is not expected to happen before the winter 2009-2010 shutdown.
COOL-37	**30.10.09**	Full support for Oracle on Linux SLC5.	In progress.	For the time being, support for Oracle on SLC5 can only be provided if a special installation procedure is used to bypass the SELinux security constraints for the Oracle client libraries. This is due to known incompatibilities of these libraries and SELinux, which are being followed up by the PF team with Oracle Support. The issue is expected to be fully resolved by the upgrade to the upcoming Oracle 11.2 client libraries in Q4 2009.
COOL-39	**30.09.09**	Performance improvement for CLOB data (bulk retrieval).	New.	During Q2 2009 Atlas reported slow performance for read access to COOL folders containing CLOB data. The COOL implementation should be changed so that CLOB data are retrieved in bulk via CORAL rather than row by row.
Comments and Additional Information				