QUARTERLY STATUS REPORT				
Project Name			**Date**	
Applications Area			10.7.2006	
Report Period			**Author Name**	
2006 Q2			**Pere Mato**	
Milestones for the Quarter			**Status**	**Comments**
SPI-1	**31.12.05**	Provide the tools for generating CMT and SCRAM configurations from a common generic configuration description based on XML description files. Be able to update the web and distribution's kits from	Partial completion. Rescheduled 30.09.06	A first version of the tool to generate the distribution kits (tarballs) from the XML description files has been created. The update of the web pages will be integrated in the next quarter.
SPI-4	**31.03.06**	Generate CMT configuration and distribution kits from the common (XML based) configuration description.	Recheduled 30.09.06	After discussion with Atlas and LHCb, the deployment of the generation for LCGCMT was postponed until the next quarter to allow for some major updates in the LCGCMT environment. These updates will allow Atlas a significantly more easy integration of LCGCMT into their nightly build
SPI-5	**30.06.06**	Provide the tools for the pre- and post-build procedures for the AA projects and externals through a web interface, such that it can be done or triggered by the project release managers.	Done	An initial web page has been set up allowing the project librarians to trigger the post-build procedure once a project is build on all platforms.
ROOT-5	**31.03.06**	The Python interface to ROOT (PyROOT) adapted to directly use the new C++ reflection library (Reflex). This would avoid the intermediate software layers and additional dependencies of the current implementation, improving the overall design and	Rescheduled to 31.03.07	This milestone is postponed. It can only be done once the CINT data structures are replaced by Reflex. This work is currently on going and is expected to be completed by the end of 2006.
ROOT-9	**30.06.06**	First version of CINT running directly with the Reflex data structures as part of the ROOT June release	In progress. Rescheduled 31.12.06	The time scale for this milestone has been very tight. We cannot meet this milestone, it would have to be postponed to the December release. During the initial implementation, we decided to be more ambitious than in the original plan and to take this opportunity to make deep restructuring of the CINT kernel, such that making a thread safe version of CINT later will be easier.
ROOT-10	**30.06.06**	The new Fit GUI released as part of the ROOT June release.	In progress. Rescheduled 31.10.06	A first important component of the Fit panel is part of the 5.12 release. The function editor GUI (TF1Editor) is available and it provides full control on the parameters of the function/histogram to be minimized.
COOL-4	**30.06.06**	Support for multi-channel bulk insertion operations.	In progress. Rescheduled 30.09.06	In progress.
SIMU-1	**15.12.05**	Apply the Fluka-Geant4 (Flugg) geometry interface to one of the LHC calorimeter test-beam simulation.	In progress. Rescheduled to 31.10.06	After the completion of the technical part of the work on the ATLAS TileCal 2002 extension to Fluka, consisting in producing hits using the physics of Fluka, whereas all the rest (geometry, digitization, reconstruction, and analysis) is exactly the same as for Geant4, the work is now more on the physics. The effects of the Birks' law and of the time window in which to consider the particle contributions have been studied in detail, and discussed with the MC experts. The results obtained for muons and electrons, using the correct TileCal setup, for both Geant4 and Fluka, are currently cross-checked with the ones obtained by considering a simplified setup, in order to fully understand the differences seen between the two simulation engines.
SIMU-4	**31.03.06**	First results of the ATLAS combined and 2004 test-beams data comparisons.	In progress. Rescheduled to 31.10.06	ATLAS analyses of the 2004 combined test-beam data are progressing, but slowly than expected, due to the pressure for the detector completion.

SIMU-8	**30.06.06**	New generator level production framework: beta release (from SIMU-2, due 15.12.05)	Achieved	The generator level production framework is currently of production quality. Indeed it will be used by CMS for the forthcoming CSA06. A new milestone concerning the customization to the LCG environment, and extension of supported generator packages (including MCDB) will be set (summer review of LCG Generator milestones).
SIMU-9	**30.06.06**	Investigation of correction for test-beam data for validation of stand-alone simulation engines (VD617)	In progress. Rescheduled to 30.9.06	The work by Tancredi-Carli and A.Ribon, to evaluate the corrections for digitization and reconstruction effects for some observables of the ATLAS electromagnetic barrel calorimeter test-beam of 2002, is progressing, although slowly due to the busy agenda of both.

Summary of Progress

The Applications Area projects has continued to support the experiments in their preparation of the software releases that are going to be used in the various data challenges and productions. Several iterations of the software have been made available a various configurations to allow experiments to integrate the new functionality and be ready with a production quality release by this summer.
New procedures for testing and building the software are being put in place to optimize the time that takes to integrate by the experiments the changes and bug fixes in libraries provided by the AA.

In the ROOT project many developments have happen in the integration of C++ interpreter (CINT) and the C++ reflection system (Reflex). It is planned to release the new system this fall. The mathematical libraries have been consolidated and additions have been added concerning Fast Fourier Transforms and Multivariate Analysis.
Many developments are currently been done in the PROOF system as the result of the serious testing done by ALICE. Important performance improvements are being introduced when accessing remote files. The first batch of these improvements is available in version 5.12.

The POOL/CORAL project has been consolidating the generic RDBMS interface for Oracle, MySQL, SQLight and FroNTier. New functionality has been developed for improving the overall reliability of user applications with database back ends. This new functionality consists of database lookup by logical name; fail over to other databases; connection pooling; authentication and monitoring facilities. In addition, the COOL project (conditions database) has been improving the versioning capabilities by the use of tags and hierarchical tags.

The Simulation project is putting considerable effort on the study of hadronic shower shapes, to understand the discrepancies observed between simulation and test-beam data. Also comparisons between Geant4 and FLUKA simulation packages are being made with the help of the set of tools that has been developed to facilitate this task.
A new version of the Geant4 has been released. It includes a new precise elastic process for protons and neutrons, which approximates the cross-section and models with higher precision the final states for projectile for Hydrogen (energies T=100 MeV to 2.0 TeV), and for d and 4He targets (T=30 MeV to 900 GeV). It is particularly relevant to improving the accuracy of energy deposition in scintillators. In addition, the new G4 version includes a new efficient method to detect overlaps in a user's geometry, and updated particle definitions to match with PDG-2005 among other improvements.

Outstanding Issues since Last Report

Milestones Changes and Actions

References and Hyperlinks

New Milestones Proposals				**Comments**
SPI-6	**30.09.06**	Move the build infrastructure of the LCG AA projects from scram version 0 to scram version 1. Provide the initial setup for the projects in collaboration with the experts on scram v1 from CMS.	New	Currently the AA projects build using scram version 0. Moving to version 1 would help CMS to get the configuration directly.
SPI-7	**30.09.06**	Port the external packages and SEAL to the osx104_ppc_gcc401 platform (Mac OS X). Update the configurations to accomodate the new platform.	New	The port need to be finished and validated to allow experiments to port their applications to this platform.

ROOT-12	**31.12.06**	Speed-up I/O performance with remote files by eliminating as much by minimizing the number of network transactions.	New	The ROOT project intends to continue the important developments part of 5.12 to speed-up I/O performance whith remote files. We would like to eliminate as much as possible the effects of latency by minimizing the number of network transactions, in particular when writing or reading large ROOT Trees. This work implies a close cooperation with other teams (xrootd, dcache, gfal) developing network file servers. All applications using ROOT I/O will benefit from these developments. The first experience with PROOF on the Alice CAF indicate that these developments are very important.
ROOT-13	**31.12.06**	Improvements in the PROOF system to support a realistic analysis environment for an experiment.	New	The following improvements in PROOF are expected. - New packetizer algorithm with finer grain scheduling avoiding startup delays and tail effects. This should improve performance considerably. - Having completed successfully the ALICE data challenge. Note that ALICE puts quite some demands on PROOF due to an analysis model where events are spread over more than one file. - First implementation of a scheduler allowing optimal use of the PROOF cluster resources under multi-user load.
POOL-3	**30.08.31**	Finalize the migration POOL/CORAL to the new platforms (MacOSX, SLC4_amd64) with regular builds, and full running of the functional and data regression tests. Migration to scram v1	New	
POOL-4	**30.09.06**	Development and deployment of LFC-based lookup and DB authentication services of CORAL	New	
POOL-5	**30.10.06**	Complete migration to CORAL (AttributeList) and the SEAL component model of all POOL components	New	
POOL-6	**31.12.06**	Make all CORAL components thread-safe.	New	
SIMU-11	**31.12.06**	Report on the main physics effects responsible for the hadronic shower development in Geant4 simulations.	New	ATLAS and CMS calorimeter test-beam data appear to indicate that high-energy hadronic shower shapes, as produced by the Geant4 QGSP Physics List (which is the most used by the LHC experiments), start earlier and are shorter than the current test beam data. In some cases better agreement has been found with the LHEP physics list, which utilises only parameterised models. Given that the hadronic shower evolution is the convoluted result of many interaction processes at different energy scales, a systematic and thorough investigation of many physics cross-sections and processes is needed in order to understand the potential sources of discrepancies. Additional verification against microscopic data will be undertaken for key cross section or modelling aspects, which are identified as most relevant. Where deficiencies are found, we plan to seek appropriate refinement of cross sections or improvements of existing models by comparing with the latest microscopic data. Where needed alternative models, existing or new, will be used or sought also. Given the wide scope of this study, wh
Comments and Additional Information				