

QUARTERLY STATUS REPORT				
Project Name		Date		
Applications Area				
Report Period		Author Name		
2006 Q1		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 the same description.	In progress. Rescheduled to 30.06.06	Work is ongoing to provide the web and distribution kits from the XML description files. Other work of higher priority during the quarter led to a rescheduling of this milestone into the second quarter.
SPI-2	28.02.06	Provide a web based "user discussion forum" service interfaced with Savannah. This new service should allow projects and experiments to easily setup and manage discussion subjects.	Achieved	The new HyperNews pilot service was presented at an Applications Area meeting in February. After this it was transformed into a production-quality service. It is used by ATLAS and CMS,
SPI-3	31.03.06	Provide the interconnection/interoperability between the savannah and HyperNews services.	Achieved	During discussions with the users it became clear that the functionality of the services are sufficiently distinct such that no direct interoperability between the two services beyond the cross-linking via hyperlinks is required.
SPI-4	31.03.06	Generate CMT configuration and distribution kits from the common (XML based) configuration description.	In progress. Rescheduled to 30.06.06	The implementation of the functionality is done, deployment will take place after a discussion with the maintainers of CMT and the main users which was rescheduled for the second quarter of 2006.
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 maintainability.	Postponed. 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-8	31.03.06	Have the rootcint dictionary code generator interfaced with the Reflex and gccxml options	Achieved	This milestone has been achieved and the code is part of the version 5.10. Currently 3 options are supported by rootcint -A, rootcint -cint -B, rootcint -reflex -C, rootcint -gccxml The option A is the current default option generating the CINT data structures and API. The option B generates calls to the Reflex API and use an extended version of the CINT header files parser. It will become the default option as soon as the CINT/Reflex integration is completed. The option C generates the same code as option B, but requires the gccxml parser.

COOL-1	30.11.05	Conditions Database (COOL) release based on the latest version of RAL including bulk insertion operations and extended tagging functionality.	Achieved	Internal implementation port from RAL to CORAL achieved in COOL 1.2.7 (January 16). API still based on POOL, with CORAL extensions for early adopters. Extended tagging functionalities ("user tags" and "HVS") achieved in COOL 1.3.0 (April 6). Integration with CORAL connection service functionalities also achieved in COOL 1.3.0 (higher priority for the experiments than multi-channel bulk insertion). New API based on CORAL, no residual POOL dependency. Multi-channel bulk insertion operations delayed to COOL 1.4 (Q2 2006). New milestone proposed.
COOL-3	31.03.06	COOL overall performance study and validation of the experiments requirements. This study should identify the areas that will require further work and optimization.	Achieved	Validation of the ATLAS 'first pass' reconstruction use case achieved in October 2005 (one retrieval of full DCS data snapshots every 5 seconds from an Oracle RAC cluster, corresponding to sustained data rates of 20 MB/s and 200k table rows/s). Performance optimizations for single version folders implemented in COOL 1.3.0 (April 6): removal of linear increase in retrieval time of an IOV with the start-of-validity timestamp. Further performance optimization for multi version folders delayed (no timescale) because the relevant person has left the development team and needs to be replaced. Also identified potential problem with large number of tables in the schema. Will be worked on in Q2-Q3 (no firm milestone as no firm experiment request yet).
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 30.06.06	Technical part of the work completed, consisting in producing hits using Fluka, and then analysing them in the exact same way as for hits produced with Geant4, for the ATLAS TileCal 2002 setup. The work is now devoted to more physics issues: cross check with muons; effect and modeling of the Birks' law; sensitivity of physics observables to the chosen production/tracking cuts; impact of neutrons to the shower shapes. Close interactions with the model developers is now needed and have started. Results are expected for the second quarter of 2006.
SIMU-2	15.12.05	Production quality release of the MC generator level production framework.	Deleted	Original milestone was delayed to 30.06.06 and reformulated as SIMU-8
SIMU-4	31.03.06	First results of the ATLAS combined and 2004 test-beams data comparisons.	In progress. Rescheduled to 30.06.06	Lot of activities are undergoing in ATLAS to analyse the 2004 combined test-beam data, and the first results are now expected now for the second quarter of 2006.
SIMU-5	31.03.06	Monte Carlo event generator files database (MCDB) publicly available and able to deal with large files.	Achieved	Introduction of MCDB Grid certificates and management of large files. Successfully completed on time

SIMU-6	31.10.06	First release of a common framework for handling MC truth information to be used by experiment's simulation programs.	Achieved	Example of MC-truth handling using the HepMC structure has been implemented and communicated to the LHCb and CMS experiments. LHCb is currently implementing a new MC-truth handling based on this example. CMS is evaluating the approach. The example will be also proposed as 'extended example' in Geant4.
SIMU-?	30.04.06	Improved regression suite for release validation and testing infrastructure	Achieved	The acceptance suite was extended to monitor the number of steps and tracks per event for each particle type. The statistical power of the comparison of the total visible energy was evaluated for samples of one to 20000 events. The study compared two alternatives for hadronic elastic scattering, demonstrating the resolving power of the chosen event sample of five thousand events to discern differences resulting in variations of total energy deposition of 4%. In addition a tool has been created for future studies of this type.
SIMU-?	31.03.06	Geant4 development release including new tool for overlap detection at geometry construction and extensions to QGS	Achieved	The March Geant4 development release (ref-03) included several fixes and a number of improvements. A new precise elastic process for protons is included, which approximates the cross-section and final states for projectile p (energies T=100 MeV to 2.0 TeV), d and 4He targets (T=30 MeV to 900 GeV). A new method for overlap detection was included already in release 8.0 (December 2006). Contributions from other Geant4 collaborators included a prototype Python interface module, which interfaces to key Geant4 classes using Boost.

Summary of Progress

The main activity during this quarter has been the preparation of the software releases that are going to be used in the various data challenges and combined test runs of the LHC experiments during this year. About half of the functionality of SEAL has been completely migrated to ROOT and the experiments and the AA projects had made considerable effort in adapting their software to use the packages that have been migrated. A detailed plan has been started to be prepared for the migration of the second half of the functionality. During the quarter many different releases and software configurations has been produced to help the experiments for the preparation of their production releases. POOL products such as CORAL and COOL are comming with new functionality requested by the experiments. ROOT has made one development release including new functionality plus several bug fix releases, Geant4 has made various patch releases to support the experiments, and new versions of GENSER and GDML has been released. The HepMC package was installed in the LCG external area and is maintained by FNAL effort. Concerning architecture and platforms. The AA software is being adapted for the AMD64 architecture and this is almost complete. Certification and preparation for the new Linux SLC4 has been made. Next releases will be made available for this new platform.

Outstanding Issues since Last Report

Milestones Changes and Actions

Two simulation milestones, which were level 2 milestones for the simulation project, has been added to the list to better reflect the progress made by the project. New longer term milestones will need to be defined for ROOT and POOL projects. This will be done during the current quarter.

References and Hyperlinks

Milestones for Next Quarter			Status	Comments
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	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.
ROOT-10	30.06.06	The new Fit GUI released as part of the ROOT June release.		At the same time an extension of the Virtual Fitter that uses the new libraries in MathCore and MathMore will be developed.
SIMU-8	30.06.06	New generator level production framework: beta release (from SIMU-2, due 15.12.05)	In progress	A lot of effort in the quarter, driven by the development of the new CMS generator level simulation framework. Prototype is now available. It seems realistic to start migration to LCG during the 2nd quarter.
SIMU-9	30.06.06	Investigation of correction for test-beam data for validation of stand-alone simulation engines (VD617)	In progress	Just started to evaluate the corrections for digitization and reconstruction effects for some observables of the ATLAS electromagnetic barrel calorimeter test-beam of 2002. Preliminary results of this investigation should be available in the second quarter of 2006.
New Proposed Milestones			Comments	
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.	Pre-build procedures are mainly the allocation of the AFS space (AFS volumes) for the release. The post-build procedures consists of generation of documentation, tarballs, etc.	
COOL-4	30.06.06	Support for multi-channel bulk insertion operations.	Functionality not yet implemented from COOL-1 and with lower priority.	
Comments and Additional Information				