

Applications Area Report

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To follow the progress the Applications Area we did introduce in first quarter the JIRA tool (<https://sftjira.cern.ch>) and we have been using it to discuss and agree the work items with the stakeholders, mainly the LHC experiments in the context of the Architects Forum, and monitor progress within the various AA projects. We can very easily query which are the 'user stories' that has been completed for a given software release (see some of the predefined queries in the [popular filters](#)).

ROOT

The ROOT project released a new production version 5.30/00 on June 28. This version featured prominently, as default, a new "modern" look of the ROOT graphics as well as the introduction of CMake as an alternative build tool to generate native makefiles and workspaces (i.e. Xcode, Eclipse, Visual Studio). In addition there were many other changes in basically all parts of the system that are described in detail on this location: <http://root.cern.ch/root/html530/notes/release-notes.html>.

Persistency Framework

New releases of the PF projects have been prepared in Q2 2011 for the two new configurations LCG_60c for ATLAS and LCG_61 for LHCb. Both releases, motivated by the upgrades to new versions of ROOT (5.28.00e and 5.30.00, respectively), include major changes in CORAL and several fixes and enhancements also in COOL and POOL. These releases also include a new Oracle client configuration (11.2.0.1.0p3), to work around the redefinition in the Oracle client of some kerberos symbols, conflicting with those in the system libraries.

The new CORAL 2.3.16 code base, from which both LCG_60c and LCG_61 have been built, includes a major internal reimplementations of the OracleAccess plugin. This patch fixes potential crashes when manipulating queries created on sessions that have become invalid, in both single-threaded and multi-threaded use cases.

In collaboration with the ROOT team and several teams in IT, the PF team was also active in following up a service incident affecting the Kerberos KDC at CERN, that had initially been reported as possibly caused by the POOL software. The main cause of the problem was eventually identified as a bug in the xrootd client; a fix for this issue, already included in ROOT 5.28, was picked up by ATLAS in a backport to 5.26.00f.

Finally, the future of POOL was discussed with ATLAS and LHCb during Q2 2011, motivated by the recent decision by LHCb to drop POOL in favor of direct ROOT access, which will leave ATLAS as the only user of POOL. It is likely that the POOL code and the responsibility for its support will be taken over by ATLAS, on the timescale of the LHC shutdown in 2013 or possibly earlier.

Simulation

The new Beta release 9.5-beta of Geant4 has been released on schedule in June. Several contributions to the physics code have been included, to note the improvements and the new tuning applied to the Bertini Cascade, where trailing effect has been added

(contribution from colleagues at SLAC); improvements and extensions to the FTF hadronic model, now simulating barion - anti-barion annihilation, anti-barion - nucleus, anti-nucleus-nucleus and nucleus-nucleus interactions; improved calculation of the excitation energy in the QGS model, now taking into account binding energy; several new developments in the hadronic neutron package, upgraded to use ENDF/B-VII.0 with also the possibility to make use of the complete data set from IAEA (CIEMAT team contribution). To also mention the implementation of a new alternative version of the Urban multiple-scattering model, providing improved sampling of angular distribution's tail and lateral displacement.

The new release introduces a new scheme for ordering physics processes, implementing a mechanism for assigning automatically the correct ordering to processes being registered; also introducing a new mechanism for checking Energy/momentum (E/p) conservation in all hadronic models, where limits can be set per model.

The implementation of materials has been revised and extended to allow for sharing of internal tables for dE/dx and cross-sections between similar materials, thus enabling the possibility of defining materials with common table entries and varying densities.

9.5-beta also includes an embedded module for the CLHEP classes (based on CLHEP-2.1.0.1), allowing for the installation of the Geant4 libraries in a stand-alone mode without requiring an external dependency on CLHEP.

The CMake build system has been extended in 9.5-beta, now covering all build options and drivers available in Geant4.

The web site of the Physics Validation project (<http://sftweb.cern.ch/validation/>) has been populated with first plots from experiments comparisons of test-beam data vs. Geant4 simulations. A second round of plots will come later in the year, with the idea to also include beam plots coming directly from the experiments.

The implementation of a lightweight bootstrap script for GENSER has been completed and the script is available from the GENSER web page <http://sftweb.cern.ch/generators>. The code repository for GENSER has migrated from CVS to SVN; GENSER now relies entirely on SVN.

SPI

There has been a new release of a configuration in the LCG_60 cycle. The efforts for a gcc45 and Scientific Linux 6 adaption have been continued, and new platforms have been integrated into the nightly build infrastructure.

Currently, a new release cycle is in preparation. This will include a major cleanup, removing remnants and compatibility packages for superseded operating systems and compiler versions. A major update of Python related externals is as well part of the new cycle. The first version of this cycle is expected in August.

The user survey to identify the long-term needs for issue tracking services at CERN has been finished. The results have been presented at the CERN IT Technical Users Meeting. Based on this and additional experiment feedback, SPI and IT/PES proposed to establish a new central JIRA service hosted in the CERN IT. Once a prototype service has been setup by IT, SPI will evaluate whether and how to migrate all existing Savannah data into this new service.