

Applications Area Report

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May 2012

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AA Planning

At the beginning of the year we have updated the plans for each of the projects using the JIRA tool (<http://sft.its.cern.ch/jira>) and these plans has been discussed at the AF meetings with the experiments. Filters selecting the current 'stories' for each of the projects have been created at <http://sft.its.cern.ch/jira/secure/ManageFilters.jspa> for easy consultation.

ROOT

ROOT development in these last few months has focused on native MacOS X graphics support (in addition to good old X11) and on pure Javascript ROOT file access. The new MacOS X graphics interface provides easy access to advanced graphics options like shading, transparency and color gradients (which at a later stage will be back ported to the X11 and Win32 back-ends). The ROOT file access via Javascript allows the reading of any object from a ROOT file natively in any browser, without having to install anything special on the server. This will be ideal for web based histogram viewers, like Q&A monitoring environments. In addition to these two main areas, which will be part of the upcoming May release, a lot of progress is being made with the integration of the new Cling C++ interpreter scheduled for introduction by the end of the year.

Persistency Framework

Four new releases of the Persistency Framework projects have been prepared in Q1 2012 for ATLAS (LCG_61d, LCG_61e), CMS (CORAL 2.3.21) and LHCb (LCG_62b). All these releases include code base and configuration changes to complete the port of CORAL and COOL to Oracle 11g servers (working around an Oracle feature causing frequent ORA-01466 errors in the nightly tests). The LCG_61d and LCG_61e releases, motivated by urgent bug fixes in POOL for ATLAS, also include a few external package upgrades (uuid, frontier_client); LCG_61e is actually an urgent rebuild of LCG_61d, after downgrading back the version of ROOT to 5.30.05 because 5.30.06 breaks binary compatibility due to some API changes. The CORAL 2.3.21 release includes a possible fix for some ORA-25408 errors observed by CMS during database and network instabilities. The LCG_62b release, motivated by an urgent bug fix in ROOT, includes several additional fixes and improvements in CORAL and COOL, completing the port of the two packages to the clang30 compiler on SLC6.

Major progress has been made also in the improvement of the reconnection mechanism in CORAL to react to network and database glitches. The old reconnection mechanism (valid for all backends but affected by several bugs) has been completely replaced by a new reconnection mechanism, which is only valid for the Oracle plugin but is much more stable and better tested. This work will be included in the next CORAL release 2.3.23, under preparation.

Simulation

New correction patches (9.5.p01 for the 2011 release and 9.4.p04 for the 2010 release) have been provided in March, including important fixes for issues also reported mainly by ATLAS and affecting both the 9.4 and 9.5 release series. These include corrections in the electromagnetic processes, like the addition of protections in the Urban multiple-scattering model to avoid artificial scattering of big angles for high-energy e^{+-} ; a fix to sampling at small steps (below 10 μm) for fluctuation in heavy media, to correct shift in range of 3 MeV muons and a fix to the WentzelVI multiple-scattering model for the sampling of single scattering. Observed rare cases of massive energy conservation violations have also been corrected in the CHIPS capture-at-rest process.

Patch 9.5.p01 also includes a fix in the hadron-elastic process for a problem of memory growth observed in release 9.5 of last December.

Two bug-fix releases 2.06.07 and 2.06.08 for HepMC have been also provided, where installation scripts of the package have migrated to adopt CMake.

The GRID tools to run validation and regression testing of Geant4 on distributed resources have been consolidated and a list of reliable sites where to run the Geant4 validation suite has been identified (CERN: 35%, KEK: 35%, France: 20%, UK+Nikhef: rest). Tools and scripts, even if developed for Geant4 validation, can be adapted to any application, which needs to run on the GRID and produces relatively small output (CPU bound).

A new note (CERN-LCGAPP-2012-01) describing the use of shower moments for presenting in a compact way properties of showers induced by high energy primaries in calorimeters has been prepared and is now available.

SPI

In the period of February till April the SPI project prepared in three releases. LCG_62b is the basis for this year's LHCb data taking releases, and contains an urgent bug fix of ROOT and minor changes on CORAL and COOL. LCG_61d and LCG_61e are used by the ATLAS experiment. They contain upgrades to the frontier_client and uuid, to fix issues with the multiprocessing versions of the ATLAS applications. Recently a prototype project for providing full packaging of the LHCb, ATLAS and LCGCMT software stack was started. First results look promising.

The introduction of clang as an additional compiler in the nightly builds was finished and the integration of gcc47 into it started recently. The common efforts with IT on establishing a JIRA service now resulted in a Savannah-like portal that allows the registration of individual projects. The preparatory work for migrating issues from Savannah to this JIRA service is still ongoing.