Applications Area Report
Feb – Apr 2011

May 2011

Pere Mato

We have introduced a new tool (JIRA) to manage all the projects in the Applications Area as an attempt to make them more agile, transparent and accountable towards the experiments. The tool maintains the master to-do list for each project in terms of 'user stories', which are discussed, prioritized and agreed at the Architects Forum. Each 'story' is broken down into some 'tasks' that are scheduled by the project teams. Everybody can monitor the progress of the Application Area (https://sftjira.cern.ch)

ROOT

A development release v5-29-02 has been made just before Easter. One of the main features of this release is a new default canvas graphics style (available as style "Modern"). This new style is a synthesis of different style templates used by the LHC experiments. The old style remains available as "Classic".

The 500 pages of the ROOT User's Guide has been maintained for many years in a *Word* document. This format makes this guide difficult to maintain and extend. It was decided to move the document into *Docbook* format. This work is in progress and a new manual should be ready for the v5.30 release this summer.

Besides support of the current interpreter and dictionary system, progress has been made with the LLVM-based interpreter prototype, mostly in the areas of backward compatibility with existing user code, study of the interpreter's use in multi-threaded environments, and its usability (error recovery, value prompting, location of precompiled headers). Some of these resulted in improvements of LLVM itself.

The ROOT GUI is in the process of being modernized as well as becoming user-friendlier. One prototype of the GUI using OpenGL has been made and is partially working but requires much more work to be operational. Other technologies (e.g. for portable devices) are under evaluation. The stability of ROOT on Windows has been improved and some missing features are being developed.

Persistency Framework

New releases of the PF projects have been prepared for the two new configurations LCG_60a and LCG_60b. Both releases were motived by the upgrades to new patches of ROOT 5.28 and by fixes in other external packages (frontier_client and Qt, respectively).

A major internal reimplementation of CORAL plugins is also underway to fix several crashes reported by the users and/or observed in internal tests. These crashes generally take place when manipulating queries created on sessions that have become invalid, either because the users have closed them or because they have been interrupted by network glitches and automatically restarted by CORAL in an incorrect way. A first version of the new implementation is essentially ready for the Oracle plugin to fix both single-threaded and multi-threaded issues and is now being ported to the other plugins. These patches will be included (in one or more steps) in the next CORAL releases.

Simulation

Several developments were carried on in the first quarter of 2011 in Geant4, particularly in the physics. A first implementation of light ions interactions with nuclei has been completed and provided to ALICE for testing and validation; it includes refined modeling of anti-nucleon nucleon interactions within the FTF hadronic model. The Geant4 hadronic framework has been enhanced with the addition of E/p checking limits for all hadronic models, to enable for automatic checking of energy non-conservation.

A first patch release of Geant4, release 9.4.p01, was announced end of February, including several minor fixes to release 9.4 of last December, some also derived from feedback by ATLAS and CMS in their preliminary tests for 2011 simulation production.

In the Technical Forum held on March 3rd, the development plan for Geant4 has been finalized, based on discussions with the representatives of all LHC experiments.

A new web site for the physics validation project has been put in place: http://sftweb.cern.ch/validation/ The site, which has been redesigned based on the Drupal content management system, now includes a section dedicated to hold and display plots of the comparisons made for the validation with the LHC data.

Similarly, the Generator Services web site has been redesigned based on Drupal and can now be accessed: http://sftweb.cern.ch/generators/ Some further development and fine tuning has been made to the MCPLOT service, by adding new analyses and improving the web site. The system has been migrated to a new machine in IT and has been now officially announced to be in production service.

SPI

The consolidation of the SPI project infrastructure continues. The SPI website is now served via the central Drupal instance, and internal documentation for most of the central tasks has been updated. The nightly build infrastructure has seen major improvements such as a new implementation of the summary page taking all the improvement proposals from users into account. The other underlying tools are currently being re-factored to prepare the move to a continuous integration model. A first version, for now with unchanged feature set, was already deployed on a test infrastructure. In parallel, efforts started to use it for nightly testing of the LHCb Grid tool (DIRAC).

There have been two new releases on the "LCG 60" cycle and one new "HEPSOFT" release. Efforts for a gcc5, Windows 7 and Scientific Linux 6 adaption have been started. A distribution model for the LCG releases on the CernVM filesystem (CVMFS) has been agreed on with the experiments and will put in place for the next major release. Together with the Simulation project, CVMFS was already set up for distributing GENSER to the users.

On the issue tracker side, there have been discussions with ATLAS on Savannah feature requests and their possibility of implementation, given the limited resources. Relative priorities still need to be discussed. In the meantime, the Savannah bug report backlog, accumulated during the recent years, has been significantly reduced. Concerning the very long-term future of Savannah, efforts have started to look into potential replacements. This work is carried out in collaboration with the IT/PES group, and a single user survey about to be distributed. In parallel, the experiments as major clients will be approached directly soon. Independent of this, a production JIRA instance has been provided as project management tool after the successful internal evaluation.