Applications Area Report
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ROOT

The ROOT team held the ROOT Users Workshop from March 11-14 in Saas Fee. With 88 participants, 4 full days of talks and an amazing social program the workshop was a huge success. The ROOT team presented the state of ROOT and the many user talks focused on the usage of ROOT and on what could be improved. The talks were of high quality and the user feedback will be an important part of the ROOT plan of work.

In the last few weeks ROOT moved from Subversion to Git as its source code management system (moving to Git was one of the major requests from the workshop). For the documentation system it was decided to move from the unwieldy DocBook to Markdown as documentation system. This will help improve the documentation by making the writing of it much simpler. Better documentation was also one of the major requests coming from the workshop.

The ROOT team is making steady progress toward the major ROOT 6 release, which has been delayed for the end of the year.

Persistency Framework

New releases of CORAL and COOL have been prepared in Q1 2013 for ATLAS and LHCb (LCGCMT_64d, LCGCMT_61g, LCGCMT_65rc1). These releases introduce important bug fixes and enhancements in both CORAL and COOL, including fixes for memory leaks identified through valgrind and several improvements in the CORAL_SERVER package. LCGCMT_65rc1 is the release candidate for LCGCMT_65, expected to be released in May. It is the first production release supporting the gcc4.7 compiler on both SLC5 and SLC6, using the C++11 standard, and it also includes the upgrade to Python 2.7, Boost 1.50 and the EMI2 Grid packages. The code bases have also been ported to the latest gcc4.8, icc13 and clang32 compilers. Progress has been made in the use of several profiling tools (valgrind, igprof, gperftools) to detect memory and time performance issues in CORAL and COOL. These has been integrated in the test suites to automatically obtain memory analysis reports.

The 11.2.0.3.0 Oracle instant client for MacOSX has been installed. The new client is used by the latest LCGCMT_65 release and will be used on all future releases of the CORAL software. This client completes the move of all platforms to the Oracle 11g.

The HEP_OSlibs meta-rpm mentioned in last quarterly report has been made available on a dedicated 'wlcg' software repository on linuxsoft.cern.ch and a twiki page has been prepared to document the instructions for its installation.

Simulation

A new patch to release 9.6 of Geant4, 9.6.p01, has been released on February 1st and includes fixes also based on preliminary feedback from ATLAS and CMS. In particular, it includes a correction to sampling of scattering tail in the Urban93 multiple-scattering model and its variants, Urban95 and Urban96 for additional robustness; also includes an

important fix to address incorrect deviation in magnetic field, due to overwriting of the final momentum by the multiple-scattering process. Additional changes included are: a fix for G4TessellatedSolid on 32-bit platforms due to rounding; a fix in hadronic de-excitation in the case of Fermi breakup not splitting the nucleus; corrected issues in anti-nucleus cross-sections; a fix to restore reproducibility for QBBC physics list, and corrected parameters of stainless steel in NIST material builder.

The activity is currently focused on development for the Beta release of Geant4, which is scheduled for June. The development plan for 2013 was presented at the last Geant4 Technical Forum on March 26th and is available from the Geant4 web site.

First contacts with experiments representatives have started in order to fix a suitable date for holding a second LPCC workshop on physics validation, following the first one held in October 2011.

A new tool for physics validation of model-level testing of calorimeter energy response based on PyROOT has been implemented, providing a bridge between comparison with thin-target experiments and full calorimeter tests. Key uses are for comparisons between models and regression testing, to check whether simple energy sums (per particle) have been changed when a model has been revised or fixed; for a given observable, it is now possible to compare different hadronic models (e.g. BERT, FTFP, BIC, QGSP) for the same or different Geant4 versions.

The GENSER team is now moving the build system to the new architecture based on CMake. This will allow generators to be installed the same way as the LCG external software, possibly by the same team of librarians that is looking after the LCG external software. More than half of the generators have been already migrated. The end of May has been fixed as deadline to complete this task and to integrate GENSER entirely with the LCG external software.

CernVM

For the file system the main activity of this quarter was the consolidation of the 2.1 version, released end of January which contains several appealing features, like support for hot-patching, shared HDD caches and NFS export. The main sites have been asked to run thorough tests of the new version and this helped finding issues which have been - or are currently - addressed. The goal is to have a stable version for the LCG sites by the end of this quarter.

Concerning the CernVM appliance, the main activity has been the release of version 2.7 of CernVM, the last one based on SL5 and with Conary as package manager. Version 2.6 has been used by IT/ES for cloud tests on the Hamster/Ibex OpenStack infrastructure and version 2.7 should address several small contextualization issues raised in there. It also fixes issues raised in the context of the Virtual Analysis Facility. Discussions and investigations are ongoing about the way of adding support for CloudInit for contextualization; the request has been raised in the context of the GDB cloud activities. The goal is to have version 2.7 frozen before the summer to concentrate on version 3.0 (also referred to as µCernVM), the new generation of appliance, SL6 based, which loads the operating system from CernVM-FS, and which will support RPM as package manager.

Several improvements to the online contextualization interface have been done, in particular to the part related to cluster definition for usage on clouds.

SPI

One new LCG release (64d) was created. It finished the migration to the EMI-2 components as external grid software. A release of a new major version 65 is planned for May. On platforms, gcc48 and MacOS 10.8 were integrated into the nightly builds. The deprecation of SLC5 based builds started. However, support for some SLC5 builds is anticipated to continue at least until end of this year.

In the last few months there were activities to combine the SPI and GENSER build infrastructure. A first prototype based on CMake was made available to a small number of selected users. At the same time, the SPI project finished its migration to an Electric Commander based build scheduling and deprecated the previous infrastructure.

On Savannah-to-JIRA migration activities, the ROOT project was the first big client to be migrated to the JIRA-based infrastructure. Schedules for other projects are under discussion with the various users. The entire migration is planned to finish by end of 2013.