

Diverse topics

Geant4 Review

CERN

16-20 April 2007

Releases

Release Notes

- Process & format of notes already revised in the past
 - Emphasised information for user code migration
 - Added a specific chapter with detailed explanation
 - Increased detail for explanation of changes
 - On request of experiments
- Assembled as contribution of working-groups coordinators
 - We acknowledge the need to improve description of changes and fixes in some areas, particularly:
 - For a fix: better information of the problem addressed (or reference #)
 - Brief information on the improvement/effect expected and in which circumstances/setup
 - Process of reviewing draft release notes to improve
 - Involve more people in the review process
 - Addition of a chapter on major expected effects in physics and performance

Release Validation, Release Migration

- Testing phase for a planned release consists of 3 weeks
- Relevant “candidate” release tags are made and provided to Beta-testers/experiments to try out
 - Generally 3 weeks before the release date (release phase)
 - Collaboration with experiments required at this stage !
 - Validation tests on the GRID performed during release phase
 - CPU performance tests applied at this stage (but also before)
 - Coverage of tests under constant improvement ...
 - Basic Q/A checks (leaks, run-time errors, NaNs checks) performed during release phase and for every unscheduled release or patch
 - Expected help from FNAL contribution in future in this area
- Development releases
 - Delivered EVERY MONTH by the Geant4 Collaboration
 - Available on AFS for Beta testing at CERN with detailed notes !
 - Regular verification by experiments would help in:
 - Fast and efficient feedback to the Geant4 developers
 - Stronger and more established validation of the developments
 - Facilitated migration of client software to new releases

Dependencies

External Dependencies

– CLHEP

- Still widely used and regularly supported
- Geant4 plans to continue to use CLHEP
- A plan for packaging presented at the 2006 Geant4 Workshop
 - Several options. Implies pros & cons for Geant4 developers AND users

– AIDA

- No tools for analysis included in Geant4 at present, nor dependency on external tools
- Use of AIDA-compliant tools is made in some examples/tests
- A plan for integration of AIDA interfaces presented at the 2006 Geant4 Workshop
 - Providing analysis module with minimal functionality for filling histograms and based still on AIDA interfaces
 - Recognized the importance also for developers and testing
 - No concrete decision has been taken so far

Platforms / CPUs

Platforms

- Most recent platforms and compilers supported by Geant4
 - SLCx Linux and most recent gcc compilers, SunOS/CC, Windows/VC++, MacOSX
 - List constantly updated at every new release
 - NO assured backward compatibility with old releases
 - 64 bits systems and compilers are supported since release 8.0
- NOTE: Not all platforms/compilers can be supported
 - Limited by availability for testing and/or manpower
 - Platforms not tested cannot be officially supported
 - User contribution expected for porting issues
 - Some distributions often come with buggy or unofficial version/build of the GNU gcc compiler (SUSE, Mandrake, Ubuntu, ...) or system tools
 - Problems often resolved in successive versions of such systems
 - Very little can be done in such cases

Multi-thread * Multi-core

- Geant4 is NOT a multi-threaded software
- Parallelism at event level has been available and demonstrated also for dual-core CPUs with TOP-C
 - Other solutions for distributed computing (GRID, farms, ...) exist already with examples (DIANE, TOP-C, ecc...)
- Investigations for multi-threading are going on
 - Too early at this stage to draw any conclusion
- Note:
 - Reproducibility of simulation results and easy restore conditions is a major issue for simulation jobs
 - Not clear how this can be easily handled with multiple threads