
LCG Generator Services planning meeting

Alberto Ribon
28.11.2008

Outline

- Introduction
- Progress report
- Planning for the next 6 months
- Summary

Introduction

- Previous Generator Services planning meeting on 23 May 2008
 - Slides and minutes available from
 - <http://indico.cern.ch/conferenceDisplay.py?confId=32134>
- Regular monthly meetings with technical presentations
- Purpose of the present meeting
 - Review the progress since last meeting
 - Plan the work for next 6 months

Generator Physics meetings

- In collaboration with **MCnet**, we would like to propose a new type of meetings dedicated to **physics** aspects of Monte Carlo Event Generators for both experimentalists and MC authors.
- We are thinking to start in **February 2009**, with a meeting every 2-3 months, lasting an afternoon or a day.
- The idea would be to concentrate on one or few topics in each meeting, proposed by experimentalists or authors. We foresee short presentations, not taking more than 50% of the time, to allow plenty of time for **discussions**.
- Ordinary LCG Generator Services meetings, dedicated to more technical/software issues, will continue as usual in the other months.

Meetings in early 2009

- Mini-workshop on [EVTGEN](#) : Tuesday 13 January, 3-6 pm
- [HepMC 2.05](#) meeting : Wednesday 28 January
- 1st [Generator Physics](#) meeting in February

Work-packages

- Generator libraries repository [[GENSER](#)]
- Testing and Validation of generators
[[VALIDATION](#)]
- Event Record [[HEPMC](#)]
- Event Database [[MCDB](#)]

Progress report: GENSER

■ GENSER

- Structure stable and used by experiments
- 24 generators installed
 - <http://lcgapp.cern.ch/project/simu/generator/>
 - 1 new added on request of experiments since the last review
 - MC@NLO
 - 2 more ready, waiting for ATLAS feedback
 - baurmc ($W\gamma$ / $Z\gamma$), AcerMC (SM bkg processes for LHC)
- 1 new testing package: MC-Tester
- More generators built on Windows
 - Pythia6, LHAPDF, Photos,
 - Pythia8, Herwig, Jimmy, Hijing, Alpgen

Building generators with autotools

- The building mechanism provided by GENSET for some generators (e.g. [Pythia6](#), [Herwig](#), [Jimmy](#), [Photos](#), [Tauola](#) , [Pythia8](#), etc.) is fragile: it breaks in some platforms like Ubuntu Linux, [Fedora](#) Linux, [MAC OS X](#)
- [Autotools](#) could offer a platform-independent way for building these generators
- Based on Andy's experience with autotools in Rivet, we have prepared an ``autotoolized'' version of Pythia 419:

[`/afs/cern.ch/sw/lcg/external/MCGenerators/pythia6/419.ac\(.2\)`](http://afs/cern.ch/sw/lcg/external/MCGenerators/pythia6/419.ac(.2))

This should be equivalent to the one built with the hand-made configure script. Experiments are invited to test it, especially in Grid productions.

GENSER bootstrap

- A bootstrap script that allows to build all generators supported by GENSER has been required (by Rivet and Desy MC group)
- This is useful if you want to build a local copy of GENSER and/or to build some generators with a different version of an utility package, e.g. HepMC
- Not more than 1 version for the following utility packages should be specified: [HepMC](#), [FastJet](#), [CLHEP](#), [ROOT](#)
- One or more generators (including [LHAPDF](#)) can be built, and for each of them one or more versions can be specified (otherwise the latest version will be assumed)
- A first version, working for only some of the generators is available; it is based on [*pkgsrc*](#); work in progress

Inconsistencies of GENSER libraries

- In GENSER we build a new generator version as it comes, using normally the latest version of HepMC (and similarly for any other common package)
- So different generators, and different versions of the same generator, could have been built with incompatible versions of HepMC (and any other common package)
- To avoid this, Andy B. and James M. have suggested to introduce an extra level of subdirectory in MCGenerators to deal with versions, similar to libtool libraries...
- This is possible but more complicated to manage...
if ATLAS and LHCb agree to use the same HepMC v.
(CMS is building from source), as now with 2.03.09, we can keep the current simple GENSET structure.

Progress report: Validation

■ Validation

- All generators tested regularly as soon as new versions are installed
- Tests consist in comparing numbers (e.g. cross-sections) between two versions, new vs. current
- There is only one distribution-based test, for b-bbar production with Pythia6, provided by LHCb
- Plan to extend the distribution-based tests: two approaches will be considered and evaluated:
 - [Rivet](#) : used here for regression testing (not data validation)
 - [HepMC Analysis Tool](#) : developed by the DESY MC group (J.Katzy et al.), and presented at the LCG Generator Services monthly meeting on 5 November

Progress report: HepMC

- HepMC **2.04** has been released in June, but experiments are still using **2.03.09**
- Having only one meeting per year to discuss new HepMC releases is considered by the experiments not flexible enough for their needs.
It would be better to have [a meeting every 6 months](#) to discuss the proposed changes, while still keeping one major release per year, eventually with a minor-release in between two major releases, if needed.
- It would be better to have the meeting on HepMC 2.05 in January, to allow the experiments to better plan their migration to a newer HepMC version.

Progress report: MCDB

- CMS is interested in MCDB
 - for storing intermediate parton-level events
 - to allow exchange of files with people outside the collaboration
- CMS is currently testing MCDB for Grid productions
 - results are expected before the end of December
- The requests on MCDB made by CMS so far have been fulfilled, and passed first partial tests
- If CMS continues to use MCDB, LCG Generator Services will maintain its support for next year
 - Reduced mostly to maintenance due to LCG budget cut

Milestones overview

GENSER_1	01/12/2008	include new versions of supported generators	DONE
GENSER_2	01/09/2008	include MC@NLO, add test to POWHEG	DONE
GENSER_3	01/12/2008	evaluate autotools for Pythia and Herwig	ONGOING
GENSER_4	30/06/2008	complete the porting to Windows of the generators required by LHCb	DONE
VALIDATION_1	01/12/2008	extend the set of tests	DONE
VALIDATION_2	01/12/2008	extend Rivet validation to new C++ generators	ONGOING
HEPMC_1	30/06/2008	complete LHCb migration to HepMC-2	DONE
HEPMC_2	30/06/2008	release HepMC 2.04	DONE
MCDB_1	01/12/2008	test MCDB in CMS large productions	ONGOING

Proposed plan

■ GENSER

- Continuation of the same service
- Test autotools for building generators
- Complete the bootstrap approach for building GENSET
- Be ready for SLC5: test generators with g++ 4.3.2 and gfortran

■ Validation

- Evaluate Rivet and HepMC Analysis Tool for regression testing based on distributions

■ HepMC

- New release HepMC 2.05

■ MCDB

- Support MCDB for CMS productions

Proposed milestones

GENSER_1	01/06/2009	include new versions of supported generators
GENSER_2	01/06/2009	test autotools for building generators
GENSER_3	01/06/2009	complete the bootstrap approach for building the whole GENSER
GENSER_4	01/06/2009	prepare the migration to SLC5 : test generators with g++ 4.3.2 and gfortran
VALIDATION_1	01/06/2009	evaluate Rivet and HepMC Analysis Tool for regression testing based on distributions
HEPMC_1	01/06/2009	release HepMC 2.05
MCDB_1	01/06/2009	Support MCDB for CMS productions

LCG budget for 2009

- LCG financial support for the Generator Services project is likely to decrease by about 25% in 2009
- This will affect a bit GENSER but more MCDB

Summary

- Project running according to the plan
 - GENSER stable
 - Testing suite extended
 - Regular technical meetings
- Get feedback from experiments on autotools and be ready to move other generators
- Need to complete the bootstrap approach
- Prepare for the migration to SLC5
- Next planning meeting in May 2009