

---

# LCG Generator Services project planning meeting

---

Alberto Ribon  
CERN PH/SFT

29.05.2009

---

# Outline

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

---

# Introduction

- Previous Generator Services planning meeting on 28 November 2008
    - Slides and minutes available from
      - <http://indico.cern.ch/conferenceDisplay.py?confId=41826>
  - Regular monthly meetings with technical presentations
  - Purpose of the present meeting
    - Review the progress since last meeting
    - Plan the work for next 6 months
-

---

# 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/>
    - No new generator added since the last review
    - 2 new generators ready, waiting for ATLAS feedback
      - [baurmc](#) ( $W\gamma$  /  $Z\gamma$ ), [AcerMC](#) (SM bkg processes for LHC)
  - Most of the generators have been ported on SLC5
    - Latest version used
    - Main platform: 32-bits gcc 4.3 [i686-slc5-gcc43-opt](#)
    - Second platform: 64-bits gcc 4.3 [x86\\_64-slc5-gcc43-opt](#)  
available only for few generators
-

---

## LHCb-related items

- Anders Ryd has created a [new EvtGen version](#), by merging different branches (BaBar, CDF&D0, LHCb&ATLAS&CMS).  
This version is under testing and improvement by LHCb. When ready (few weeks) it will be installed in GENSER.
  - [HIJING](#) generator, whose authors are not supporting it any longer, has been improved by LHCb in order to have consistent behaviour in 32- and 64-bits architectures...  
As soon as we receive it, we will install it in GENSER (including SLC5 platforms).
  - LHCb is requiring support for [Mac OS X](#) for at least the main generators (LHAPDF, Pythia6, PHOTOS, EvtGen, HIJING and few others).
-

---

# Development in MC@NLO 3.4

- We are working with one of the MC@NLO authors in order to improve the structure of the package, using the latest release, 3.4 (not yet in GENSER)
  - The main idea would be to create an “utility library” (containing all the common code for all processes), plus “process-specific libraries”
    - one library per process
    - only one library can be used in each application
    - If two or more of them are linked in the same application, one would get errors (because identical routine names are used but with different behaviour)
  - It should be ready in few weeks
-

---

# Building generators with autotools

- The building mechanism provided by GENSER 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
- For the “autotoolized” version of Pythia 419:

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

available since November 2008, we did not get any feedback from the experiments: they are very busy and consider it with low priority, given that they are happy with the current building system...

---



---

# 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
  - A first version is ready and about half of the generators supported in GENSER can now be built with it
  - Progress has been very slow in the last 6 months, due to lack of man-power. It could be completed easily if we move to autotools for building all generators in GENSER
-

---

# Main proposal for the next 6 months

- To build all new versions in GENSER with autotools only
- In this way we will have feedback from the experiments
- We are committed to fix any problem promptly as they are reported. If an acceptable fix is not found within, let's say, few days, we will use (temporarily) the old approach.

## Advantages

- Speed up the transition to autotools
  - As soon the autotools building system is adopted for a generator, we can easily build it with the bootstrap script
  - New platforms, like Mac OS X, can be built easily without extra effort
-

---

# Progress report: Validation

## ■ Validation

- All generators tested regularly as soon as new versions are installed
  - Most of the tests consist in comparing numbers (e.g. cross-sections) between two versions, new vs. current
  - Distribution-based tests:
    - for b-bbar production with Pythia6, provided by LHCb
    - [HepMC Analysis Tool](#) : developed by the DESY MC group (J.Katzy et al.) and included in the LCG Generator Services
  - Plan to try also [Rivet](#) for regression testing
-

---

# Progress report: HepMC

- The experiments are still using **HepMC 2.03.09**
- Last year's new version, **HepMC 2.04**, was never used or tested by the experiments so it will no longer be supported
- The new version, **HepMC 2.05**, will be released shortly
  - Dedicated meeting, with minutes, on 28 January
  - Delay in the first beta release, ready on 16 April
  - Got useful feedback, mainly on how to include cross-section information. Second beta release available on 14 May
- Next HepMC meeting, devoted to a “pre-discussion” for HepMC **2.06** (planned for 2010), is scheduled on

**Wednesday 8 July at 16:30 (CET)**

---

---

# Progress report: MCDB

- CMS is using MCDB
  - for storing intermediate parton-level events
- CMS is also interested in MCDB
  - to allow exchange of files with people outside the collaboration

See presentations at the LCG Generator Services monthly meeting  
on 8 April 2009 :

<http://indico.cern.ch/conferenceDisplay.py?confId=56034>

---

# Milestones overview

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

# Proposed milestones

GENSER_1	01/12/2009	include new versions of supported generators
GENSER_2	01/12/2009	build all new versions with autotools
GENSER_3	01/12/2009	complete the bootstrap approach for building the whole GENSER
GENSER_4	30/07/2009	complete the migration to SLC5
VALIDATION_1	01/12/2009	try Rivet for regression testing
HEPMC_1	30/07/2009	release HepMC 2.05 and prepare for 2.06
MCDB_1	01/12/2009	support MCDB for CMS productions

---

## Summary

- Project in good shape, but running a bit slower than planned
  - The main focus for the next 6 months should be the use of autotools for all generators
  - Then, we can complete the bootstrap approach
  - Next planning meeting: end November 2009
-