

MC4LHC review of the Generator Services subgroup of the LCG (GSG).

The review of the GSG took place on the afternoon of March 25. It was chaired by the coordinator of the GSG, P. Bartalini, and attended by members of the GSG and of the MC4LHC, plus representatives of the 4 LHC experiments and of the MC developer community (HERWIG, PYTHIA, SHERPA, Alpgen, CompHEP), as well as by Steve Mrenna, from the FNAL Computing Division.

The goals of the review were:

1. to review the progress of the group in the development of the four planned working packages
2. to collect the feedback from the experiments on their preliminary experiences with GENSER
3. to collect the feedback from the MC developers on their preliminary experience of interaction with the group.
4. to formulate recommendations to the LCG and to GSG.

The slides from all presentations are collected in and accessible from the Agenda page of the meeting:

<http://agenda.cern.ch/fullAgenda.php?ida=a035836>

The topics covered during the presentations by the GSG included:

1. The generator library GENSER
2. Validation of GENSER packages
3. The Monte Carlo Database (MCDB) project

Presentations by other participants included:

1. The Durham HEPCODE project (J. Stirling)
2. The C++ development framework, ThePEG (L. Lonnblad)
3. Experience of the experimental users with GENSER (I. Hinchliffe)

Main results, points of discussion and concerns:

1. The GSG has so far met all milestones, in particular it released the first version of the Generator Service library (GENSER). GENSER is currently regularly used by ATLAS, whose representatives at the meeting expressed satisfaction with the tool. GENSER will be used in the forthcoming data challenge, mostly as a tool to distribute built libraries with proper versioning. All other experiments have started testing GENSER, although its full use is not standard practice. In particular, some concerns were expressed about the readiness of the tools mostly used by the ALICE and LHCb collaborations (HIJING and EVTGEN). A subsequent meeting of the GSG (May 13) addressed in particular the status and prospects for development and maintenance of EVTGEN. Since the review, CMS has begun evaluating the possibility of using GENSER for the next DC's.
2. The reviewers expressed serious concerns about the manpower resources available to the coordinator. The rotation of librarians, which serve for 3-month terms before returning to their home Institute, prevents a solid and continued interaction with the MC developers. The training of the librarians who are in charge of the individual packages evaporates once they are gone, and a new period of training is required to allow the new ones to undertake their job. In past, this has prevented initiated tasks to be

- completed. The current situation is considered as a serious obstacle for the development of a satisfactory collaboration between authors and the GSG.
3. Even in the cases of MC codes already included in GENSER, the interaction between developers and librarians has been judged to be in general insufficient. A closer collaboration, and a planning of the activity developed after consultation with the authors, would benefit the quality of the service, and would provide a necessary incentive for the authors to monitor more closely the progress of the work. For this to be possible, however, the concerns raised in point 2 would have to be addressed and solved.
 4. The support of the new generation of MC tools based on C++ (Herwig++ and Pythia 7) will demand an increased level of expertise, in view of the complexity of the general framework with which the codes are developed. This is one area where the GSG could provide a critical support both to the authors, and to the users. A possible area identified for this support is the documentation of the ThePEG ,documentation which could enable more developers to adopt this common framework for their MCs, by reducing the learning path. Such a documentation would also facilitate the maintenance work of the GSG librarians. Other areas of work could include the development of a GUI for ThePEG.
 5. The definition of the goals of the work packages should more closely reflect the needs of the end users and of the MC authors. This was felt in particular in the case of the MCDB development, with reference to the definition of what the database should contain and of the upload and validation procedures.
 6. The lack of a GSG coordinator with a long-term and full-time association to the job is felt as a major threat to the successful continuation of this activity.

Conclusions and recommendations:

The initial feedback from the experiments is seen as a positive indication that the products developed by the GSG address the user needs. A final proof should await the completion of the adoption of GENSER by all four experiments.

After a first phase of R&D, the path to the consolidation of this service requires however some adjustments:

1. A solution to the persistency of the librarians and, on the long term, of the coordinator, is seen as a *conditio sine qua non* for the satisfactory continuation of this activity. In addition to allow a more coherent development of the working packages, the persistency of qualified and properly trained personnel is required to guarantee adequate interactions between the GSG and the authors.
2. The communication between the GSG and the authors must be improved, both in the course of definition of the work packages, and during their execution.
3. The inclusion in the GSG of personnel with a strong background in MC development is seen as the best way to reduce the training overhead and to ensure an effective communication with the authors. Their presence could ultimately provide some extra bonuses, such as the contribution to the documentation of the codes and the development of

coding as well as physics validation.