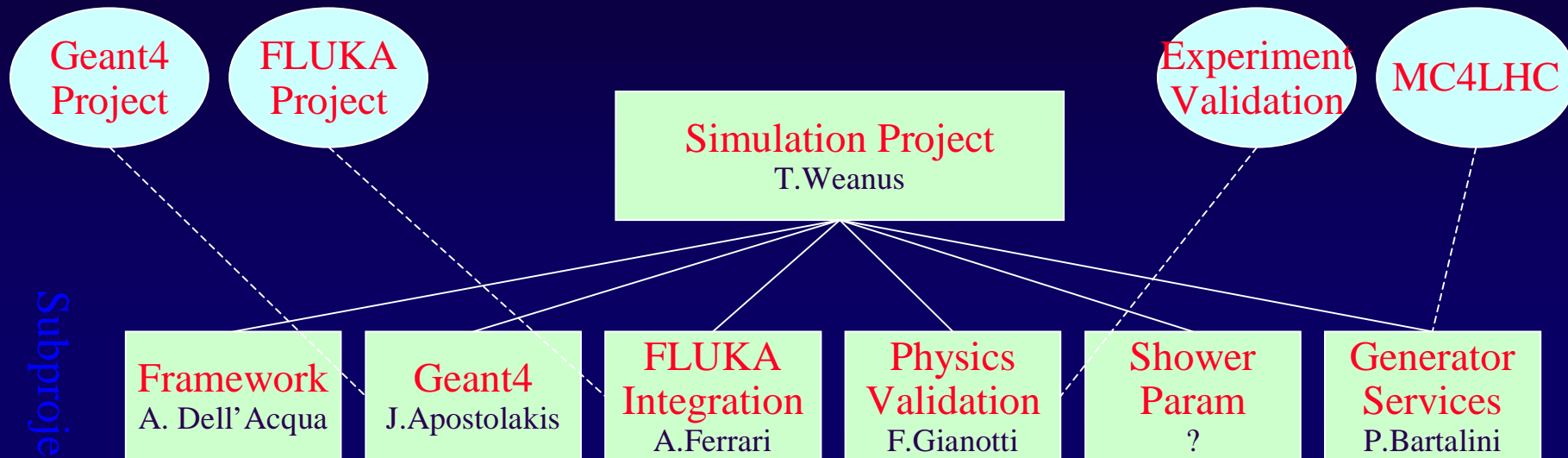




The Generator Sub-project In The LCG Simulation Project

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Simulation project in LCG-APP



Subprojects

- GENERATOR LIBRARY
- STORAGE, EVENT INTERFACES AND PARTICLE SERVICES
- COMMON EVENT FILES, EVENT DATA BASE
- TUNING AND VALIDATION OF EVENT GENERATORS

Work packages

[MC generator RTAG report](http://lcgapp.cern.ch/project/simu/generator/MCGenRtag.doc): <http://lcgapp.cern.ch/project/simu/generator/MCGenRtag.doc>



Project context of LCG SPI

LHC grid software applications

(LHC experiments, projects, etc)

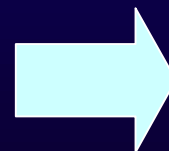
LCG Application Area

LCG Infrastructure

- Common services
- Similar ways of working (process)
- Tools, templates, training
- General QA, tests, integration, release

LCG Application Area software projects

- POOL: Persistency
- SEAL: Core common software
- PI: Physics Interfaces
- Simulation
- Detector Description
- ...etc...



LCG SPI project



Milestones of LCG-Generator

- ◆ ALPHA version of the generator repository (GENSER) ready by 06/30/2003 (OK!)
 - ◆ BETA version of the generator repository ready by 09/15/2003
 - ◆ MCDB in the LCG framework by 11/30/2003
 - Resources (1FTE) allocated by MSU and other Russian institutions participating to LCG.
 - A.Sherstnev at CERN since middle may (rotation with Y.Bugaenko and S.Makarichev expected).
 - From mid July we will have a person with a software oriented background.
- Need more resources and collaborations with the LHC experiments to cover other generator work packages



GENSER: The Generator Library

- Centrally organized code repository for generators and common generator tools
- Quick releases decoupled from large library releases
- Maintenance for all LCG supported platforms
- Top priority: HERWIG, HIJING, ISAJET and PYTHIA.
- 2nd priority: ALPGEN, COMPHEP, DPMJET, EVTGEN, GRACE, HEPMC, LHAPDF, MADGRAPH, MCDB, NEXUS, PHOJET, PHOTOS, SFM & TAUOLA

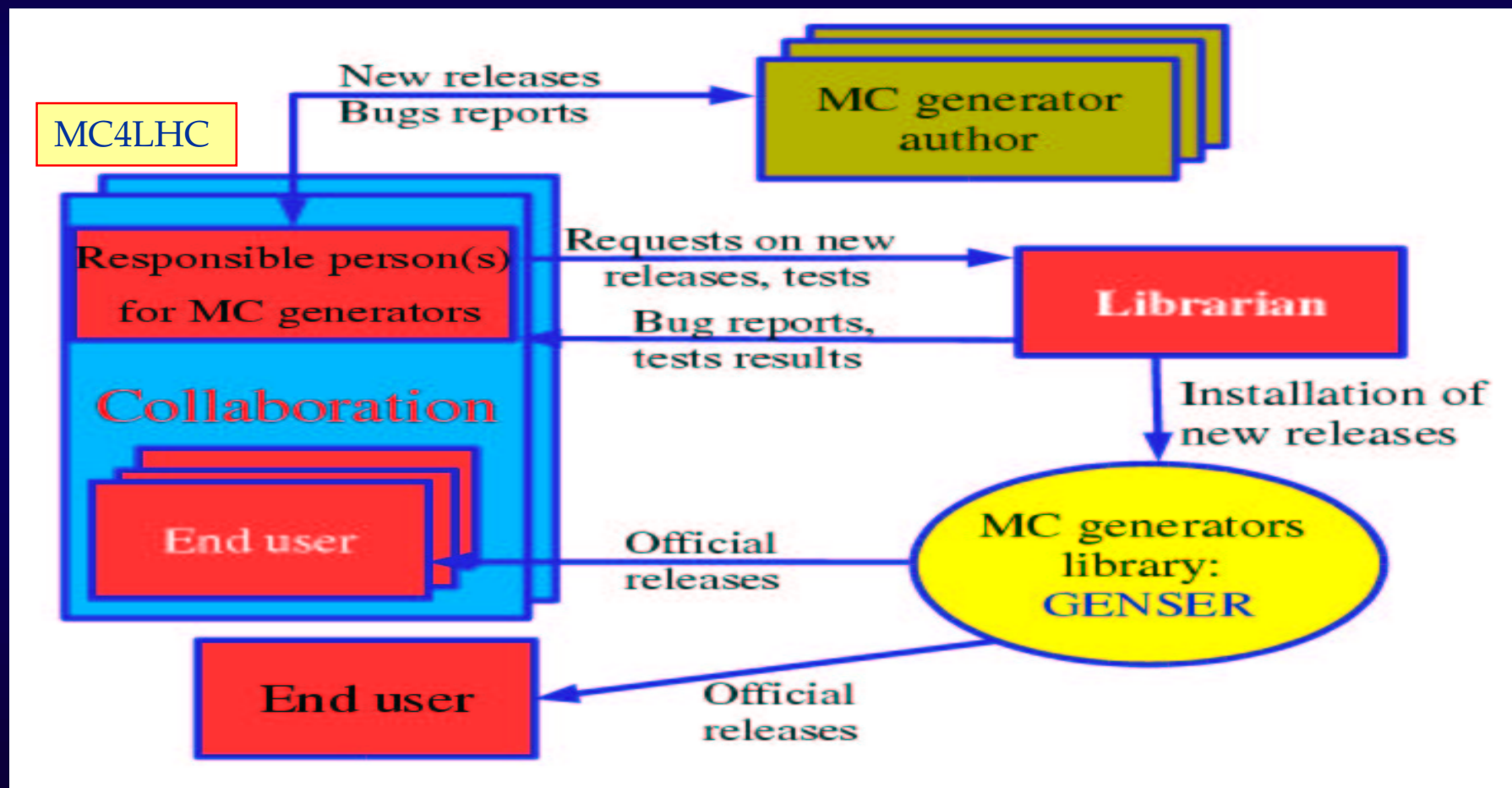
Need a second generator librarian to share the 1 FTE job



GENSER: Sub-package Versions and Validation Scheme

- ◆ CVS repository.
- ◆ SCRAM release and building tool for librarian and end users.
 - ◆ Binary distribution also provided.
- ◆ All versions released by the authors will be installed.
- ◆ Version control: old versions will be maintained as long as they are required by the end users.
- ◆ Test/Validation software for new versions has to be provided by the experiments/theory groups and can be part of the GENSER sub-packages.

Working with GENSER





Internal And External Generator Packages

- ◆ There are two possibilities for the MC generator packages.
 - ◆ To fully store the MC generator code in GENSER defining the corresponding sub-package.
 - + All the details are available to the librarian and to the end user.
 - + GENSER can become the development environment.
 - The current structures may not comply with LCG rules.
 - ◆ To install the MC generator as external software packages in the LCG environment and to store in GENSER just tests suites and other related code (examples etc.).
 - + Less stringent requirements on coding/structure.
 - Limited access to the structure.
 - Not entirely handled by LCG-generator (slower response time).
- ◆ Since both solutions have advantages and drawbacks, we do not have a final solution yet...

GENSER as a Developer Environment



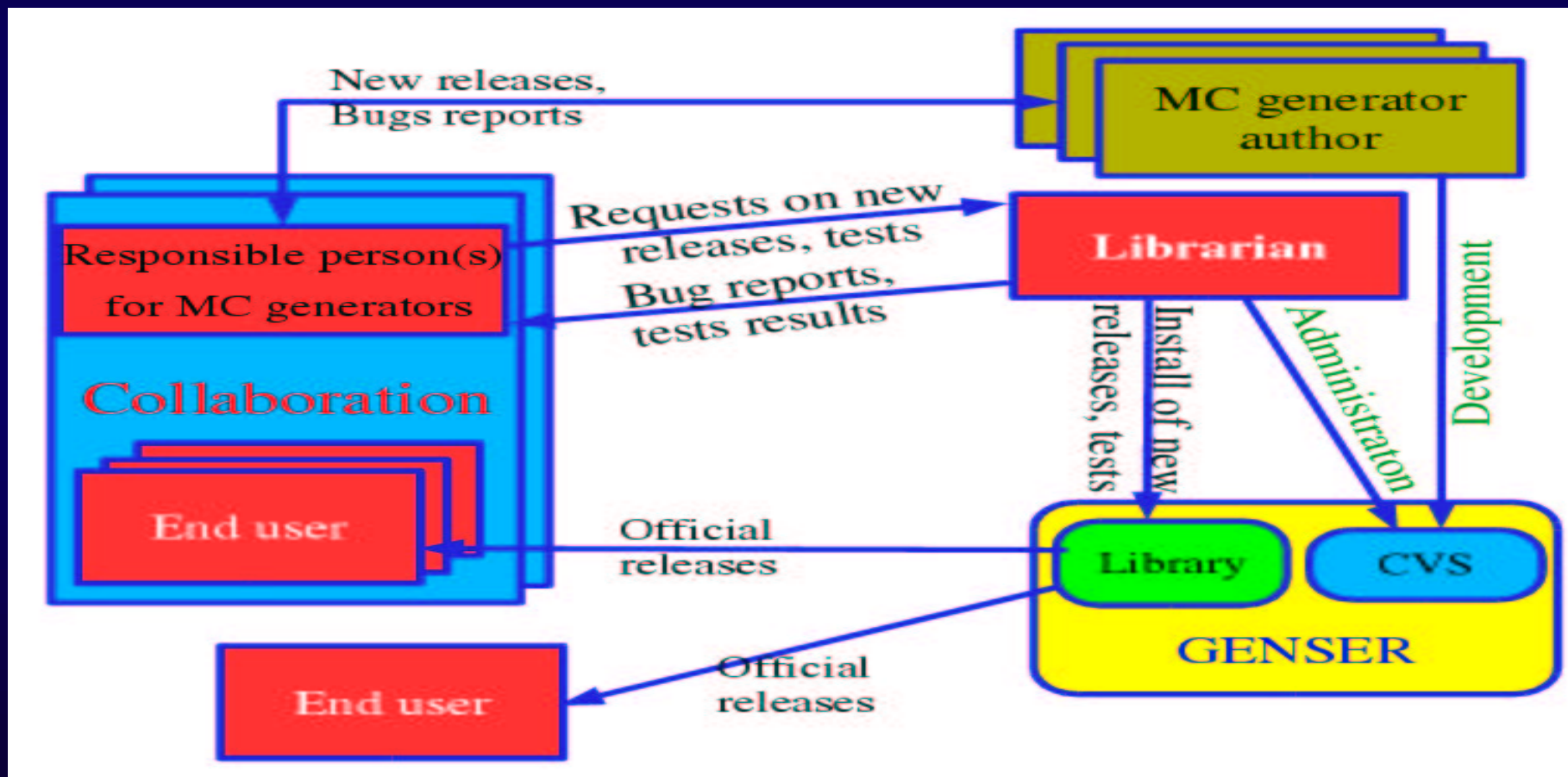
- ◆ **GENSER could become a development environment**
The authors of MC generators can use the GENSER CVS repository for development of the MC generators code.
This should apply in particular to new projects!

Advantages:

- ◆ **MC generators authors would have a convenient environment for development (SPI Tools).**
- ◆ **Coding compliance to LCG rules would be guaranteed.**
- ◆ **Release, Feedbacks and bug fixes would speed up.**



Working with GENSER as a Development Environment



LCG-Generator Progress Report



- ◆ ALPHA version of the generator repository (GENSER) ready by 06/30/2003

The screenshot shows a web browser interface for the LCG repository. The breadcrumb path is "LHC Computing Grid > LCG Applications Area > LCG Software Process & Infrastructure". The current directory is "simu/GENSER/IMCDB". The interface shows a list of files and directories:

File	Rev.	Age	Author	Last log entry
IMCDB/				
doc/				
examples/				
src/				
tests/				
README	1.1	3 days	sherstnev	The MCDB engine for MCDB sites has been placed to LCG

Below the table, there is a "Show files using tag:" section with a dropdown menu set to "- Non-branch tags -" and a "Show" button.

First milestone of the project achieved in time!!!

LCG repository for GENSER defined (thanks to A. Aimar).

Begin to fill the repository with the available code
→ first MCDB
→ Herwig and Pythia will follow

Interactions between authors, librarian and end users



- ◆ Now our main task in the GENSER project is to collect opinions and suggestions of LHC collaborations and theoretical groups about:
 - ◆ How we can organize effectively cooperation between MC developers, contact persons in the LHC experiments and our GENSER team.
 - ◆ Defining time scale and milestones on the transition to the LCG-generator environment for end-users (in particular for the simulation frameworks of the LHC experiments).
- ◆ We start to develop the effective ways of this cooperation with the LHC collaborations and with some developer of the generator packages.
 - ◆ The LHC collaborations and the developers should nominate a contact person to interact with LCG-Generator (MC4LHC)

Storage, Event Interfaces And Particle Services



- ◆ The MC truth (from /HEPEVT/ to HepMC)
 - ◆ Problems with duplication of versions/Missing translators.
 - ◆ CLHEP maintenance not satisfactory.
 - ◆ Can GENSER provide a solution ?
- ◆ The modularisation
 - ◆ Basic idea in Pythia 7, Herwig++. What are the dependencies ?
 - ◆ EvtGen: how to reuse the Fermilab experience ?
How to avoid duplication of versions ?
- ◆ Persistency
 - ◆ How to define the common event files ?
- ◆ Particle properties in the physics generators and in the simulation/analysis frameworks.
 - ◆ Is everybody relying on HepPDT ?

Common Event Files, Event Data Base



- ◆ **Motivations**
 - ◆ **Some physics processes (the most difficult for generation) should be prepared by experts or MC generators authors.**
 - ◆ **Sharing the same generator events does simplify the comparisons and save CPU time**
- ◆ **Currently there's a product fulfilling such requirements: MCDB, developed for CMS by Lev Dudko et al.**
 - ◆ **<http://cmsdoc.cern.ch/cms/generators/mcdb/>**
- ◆ **MCDB has interfaces of 2 different types**
 - ◆ **interface based on the Web: a web site with simple access to the available event samples with relative bookkeeping.**
 - ◆ **handy programming interface: automatic generation from local machine once some basic parameters have been set.**
- ◆ **It would be desirable to study how to extend this model to the new ME+PS packages**

Tuning And Validation Of Event Generators



New Fitting/Tuning Tool: JetWeb

- Based on HERA HZTOOL package – updated to include Minimum Bias data, Tevatron Jets... [J.M.Butterworth and S.Butterworth hep-ph/0210404] also submitted to Comput. Phys. Commun.
- Web page - <http://jetweb.hep.ucl.ac.uk/>
- Database of data, MC and comparisons
- Web interface allows access to DB and submission of jobs to generate MC plots
- Good starting point for the LCG-Generator Validation working package



Other issues

- The parton distribution functions
 - from PDFLIB to LHAPDF
- The “software” and “physics” aspects of the event generator validation
- Migration to LCG
 - the user, the librarian and the developer point of view)
- HepMC
- JetWeb (Hztool in C++)

Kick-off Meeting of LCG-Generator Mini w/s (20 June 2003)



- 17:00 Introduction ([Paolo Bartalini](#))
- 17:10 GENSER, the generator repository in LCG ([Alexander Sherstnev](#))
- 17:25 Parton Shower MC's ([Stefan Gieseke](#))
- 17:50 Event Simulation Tools in ALICE ([Andreas Morsch](#))
- 18:15 LHCb event generators status ([Witek Pokorski](#))
- 18:40 CMS event generators status ([Albert De Roeck](#))
- 19:05 ---long coffe- / short dinner- break---
- 20:10 Generator support in ATLAS ([Ian Hinchliffe](#))
- 20:35 HepMC Event Record - Status ([Matt Dobbs](#))
- 21:00 The requirements from TH (discussion) ([tba](#))
- 21:25 The MCDB project ([Alexander Cherstnev](#))
- 21:40 JetWeb ([Ben Waugh](#))
- 22:05 The LCG Generator subproject - organizational issues ([Paolo Bartalini](#))



Organisational Issues

WEB page:

- <http://lcgapp.cern.ch/project/simu/generator>
- links to relevant generator pages
- minutes of meetings, slides of presentations

[CDS Agenda Home](#) > [Projects](#) > [LHC Computing Grid](#) > [Physics Generators](#)

Applications area mailing list:

project-lcg-peb-apps@cern.ch

Meeting frequency:

- one per month
- proposal: last Thursday of the month at 5 PM
(with VRVS connection)
- next meeting: during this MC4LHC workshop on the 31/7 !