How to get EvtGen run inside the PandaRoot Framework
-
Solutions and Perspectives

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Outline

- Status up to now
- Work done
- How to proceed

- EvtGen code shipped in PandaRoot svn

- Need to be compiled by user.

- Result: standalone binary, f.e simpleEvtGen

- Depend on cernlib (precompiled!)

    - versions, 32/64, compiler

- g77/gfortran problem (better: libgfortran, libg2c)

Goal

- Get it compiled automagically on all systems
  - different compilers, 32/64, g77/gfortran
  - different cernlib versions?
- Have a PandaRoot Task, (standalone binary optional)

Work done

- Get it into cmake
  - CMakeList.txt file
  - Shared libEvtGen
  - Check for CERNLIB and fortran compiler
    - Added cmake modules in FairSoft (tnx F.U.)
- Add a task
  - EvtGenDirect as shared libEvtGenDirect
  - Because of dependencies NOT in libPGen (obsolete)
  - Task takes same parameters as standalone binary
- Works... ?

Trouble!

- ... works not on all systems
  - At least not out of the box.
  - Different cernlib versions have different dependencies?
  - Compilation/linking o.k. but crash on loading .. etc
- gfortran system does not mean cernlib linked with gfortran, as libg2c might be present, too.
  - A lot of checks would have to be done.
- supply full cernlib as source and compile it?
  - Not really feasable.
  - No support!

Solution

- Get rid of precompiled CernLib!!!
- What is EvtGen depending on?
  - Pythia
  - Photos
  - any more?
- And:
  - Pythia is already in FairSoft as shared lib, why not use it?
  - minicern is part of root
  - cernlib available as source code

More work done

- Use libPythia instead of CernLib one
  - works? (*)
- Photos not depending on other Cernlib modules
  - add as source code and build shared libPhotos
  - works! (**)
- EvtGen contains "unused" code which depend on CernLib
  - get rid of it (hbook...)
- Left over
  - ddilog and ranf function missing
  - add als source code
- Works!!! Bt further checks needed!

*as far as I can see
(see remark on testing)

Code structure

- /trunk/pgenerators/
  - EvtGen
    - photos (**libPhotos**, could be put anywhere)
  - EvtGen
    - (**libEvtGen**)
    - EvtGenBase
    - EvtGenModels
    - Cernlib (only two files)
  - EvtGenDirect
    - (**libEvtGenDirect**)
    - PndEvtGenDirect.cxx/h

Summary

- Proposal:
  - Add to Photos code plus needed F'ns to PandaRoot
  - or even FairSoft?

- Licence/Copyright problem?
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- No dependence on precompiled CernLib anymore!!!

Changes for the User

- none (if you want)
- (nearly) no change on EvtGen package
  - "old" way of compiling/linking against cernlib still works
  - all changes are by defines in CMakeFile.txt
- standalone binaries still in package
  - compiled automatically (which are needed???)
  - compiled from Photos/Pythia/EvtGen
  - located in build/bin/
- PndEvtGenDirect("particle","decayfile",momentum,seed);
  - before: simpleEvtGen particle decayfile #nrevts mom seed
  - before: FairEvtGenGenerator("output.evt");

Try out and check

- If you want to try:
  - Add in main CMakeList.txt
    - add_subdirectory (pgenerators/EvtGen)
    - add_subdirectory (pgenerators/EvtGenDirect)
  - Add to rootlogon.C
    - if(isLibrary("libPhotos"))gSystem->Load("libPhotos");
    - if(isLibrary("libEvtGen"))gSystem->Load("libEvtGen");
    - if(isLibrary("libEvtGenDirect"))gSystem->Load("libEvtGenDirect");
  - ... and change the generator line in your macro.
- Check it!!!
  - old way simpleEvtGen with CernLib against new SimpleEvtGen
  - can be done on text basis without analysis

Checks done sor far

- old way simpleEvtGen with CernLib against new SimpleEvtGen ... compare output.evt

- Simple decay J/psi->ee,mumu including photos, 1000Evts

  - SLC 4.7 (32), "old" cernlib 2005?

  - SLC 5.4 (64), Ubuntu 9.10(64), cernlib2006

  - no difference between old and new!

  - one rounding(?) error difference between the SLC4 and other systems

- Pythia decays not done

  - same error on all systems... decay file problem?

  - either "pythia cannot decay this particle" or "no requested process has non-vanishing cross-section."