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Geant4 & GAUDI

- *Geant4*
  - *Geant4* & *C*^{o} installation at `lxplus`
  - *GEANT4* CMT package
  - *GEANT4Examples* CMT package
- *Geant4* & GAUDI
  - GiGa Service
  - GiGa evolution
  - *GiGa* CMT package
  - *GiGaExamples* CMT package

Geant4: `$LHCBHOME/geant4/geant4.1.1/`

current instalaltion

- `VERBOSE` mode
- not good for performance measurements
- global libraries
- shared libraries

future installations

- `VERBOSE` mode and `NO-VERBOSE`
- `OPTIMIZE` and `DEBUG`
- global libraries
- shared libraries

- DAWN & DAWNFILE
- VRML & VRMLFILE
- OPACS
- OpenGL
- no RayTracer

- OPACS*
- Terminal
- GAG
- Xm, Xaw
- no XVT

no "environments"!

Geant4 Friends

- DAWN, version 3.81a
  - installed in `$LHCBHOME/geant4/DAWN` directory
  - nice visualisation
  - imitation of virtual reality
  - faster then VRML, slower then OPACS
  - high quality PostScript plots
  - `"DTREE"`
- DAVID, version 1.34a
  - installed in `$LHCBHOME/geant4/DAVID` directory
  - co-works with DAWN
  - nice (and the only one!) tool for geometry debugging

GEANT4 CMT package

- `$LHCBSOFT/GEANT4` directory
- `v1r1` "version"
- corresponds to 1.1.0 version of *Geant4*
- dummy package
- used to define via `requirements` file and CMT all environment variables
- use `source setup.csh` to configure *Geant4* for stand-alone applications
- allows to develop stand-alone *Geant4* applications under CMT environment

Geant4 & *GAUDI*

Geant4 is available in *GAUDI* via GIGA Service.

GIGA Evolution: Phase I

- direct communication of User algorithms with GIGA Service
- some *Geant4* classes are accesible in user algorithms
- any stand-alone *Geant4* application are naturally fitted into GIGA Scheme without any changes in codes!
- use *GAUDI* general services and facilities in "stand-alone" *Geant4* applications.

Geant4 & *GAUDI*

GiGa Evolution: Phase II

Transition Phase

1. enhance the functionality of GiGa by making possible to extract the event record from *GAUDI Event Store*
2. enhance the functionality of GiGa by making possible to get the Detector Description by pointing into the root of already constructed *Geant4* tree
3. automatic translation of *GAUDI* Detector Description into *Geant4* detector description.
4. automatic creation of *Geant4 Hits* and *Sensitive Volume* from their description via XML.
5. automatic translation of *Geant4 Hits* into *GAUDI* Monte Carlo objects
6. automatic population of *GAUDI Event Store* by information from *Geant4 Trajectories*

Geant4 & *GAUDI*

GIGA Evolution: Phase III

- No any *user*'s algorithm deals directly with GIGA Service and *Geant4* classes.
- All knowledge of *Geant4* will be absorbed by set of specific *Converters*.
- Specific *Converters* form an additional layer in the data flow,
- configuration of *Geant4 Physics List* and/or *Cut-Offs* using internal *GAUDI* features like *jobOptions Service* and/or *interactive scripting language*.
- embedding of the essential commands from *Geant4* interactive *User Interface* into *GAUDI interactive scripting language*.
- remove *Geant4* user interface (visualisation?)

GiGa CMT Package

- `$LHCBSOFT/GiGa` directory
- GiGa Service
- documentation file `GiGa.tex` in `$GIGAROOT/doc` directory

GiGaExamples CMT Package

- `$LHCBSOFT/GiGaExamples` directory
- Examples of usage of GiGa Service
- All 6 novice *Geant4* examples works under *GAUDI* environment without any changes in codes!