

Basic & Extended Examples Status & Plans

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18th Geant4 Collaboration Meeting,
23 - 27 September 2013, Seville

Outline

- Status of developments and work plan
- Migration to MT
- Applying Coding Guidelines
- Examples Review
- Adding a new example
- AOB

Migration to MT

- **In total: 41 of 81 examples are planned to be migrated**
- analysis [2/5]. all biasing [3], electromagnetic [7*/19], all errorpropagation [1], eventgenerator [1/6], no exoticphysics, all field [7], all g3tog4 [1], all medical [6], no hadronic, all optical [3], all parameterisations [2], persistency/P03 [1/7], radioactive decay [1/2], all runAndEvent [6], no visualization
- EM and 4 medical – only if migration is straightforward
 - TestEm1 already done last week, so it seems that the other examples can follow
- None of hadronic examples
 - It may be worth to choose one from this category, too (?)

Migration to MT (2)

- For the time being **the default number of threads** is hardwired in main

```
G4MTRunManager* runManager = new G4MTRunManager;  
runManager->SetNumberOfThreads(2);
```
- A possibility to use the new function:

```
G4Threading::G4GetNumberOfCores();
```

 - But do we want to have this value as a default?
- Setting via UI command

```
/run/numberOfThreads nThread
```

 - But this would require to update all macros to put our favorite value
- Setting via command line option, like in B4 example
 - But this would require to copy/paste the same block of code (33 lines) in all examples main functions
 - A utility class compacting this 33 lines block could help
- Setting via UI session (via extending .g4session) ?

Applying Coding Guidelines

- The coding guidelines for the examples agreed in 2011 and applied in new basic examples
- Applying them in extended examples requires an effort of all examples owners as the code was already written
 - A table for monitoring a progress maintained on the wiki page:
 - <https://twiki.cern.ch/twiki/bin/view/Geant4/ApplyingCodingGuidelines>
- The SVN hooks implemented by Gunter in May to check style rules
 - However the hooks applies only to code updates, and if the code is not touched the hooks have no occasion to do their work
- In plan: to check compliance of the guideline for macros for all examples
 - 2.4. All commands implemented in messengers should be demonstrated in a run macro (can be done also via commented lines) so that users can test them easily.
- Biggest violators (no guidelines applied):
 - **HepMC examples, MPI examples, RE05**

Examples Reviews

- List of items to be reviewed, available at the wiki page
 - <https://twiki.cern.ch/twiki/bin/view/Geant4/ExtendedExamplesReview>
- 22 review documents were uploaded on the site
 - For the time being applying the recommendations in the review are on volunteer basis
- The volunteer basis seems to be not always sufficient and it is not clear which suggestions in review were applied, which not and why
- **Proposal: make the review process more formal and require the examples developers to provide a response to the review**
 - As the review is in a text file, it will be enough just to edit the file and add a comment for each suggestion and then upload the file on the wiki page
 - When done, the WG coordinators should be informed, then they will check that there are no pending items and update the example as done
 - As we put now priority to MT migration, we can put this procedure in place in beginning of next year
 - Comments ?

Obsolete Features (1)

- Explicitly defined physics lists in examples not demonstrating physics (eg. Field)
- Obsolete command in many EventAction classes:
 - `/vis/drawTracks`
 - It sets `fDrawTrack` flag which is nowhere used as selection of tracks for visualization is done via `/vis` command
- Commands to set cuts per particle are available in `G4VUserPhysicsList` and so they are applicable to all physics lists:
 - `/run/setCut cutValue unit`
 - `/run/setCutForAGivenParticle particleName cutValue unit`
 - There is no need to define these commands in each example physics list, but it would be better to demonstrate use of G4
- Explicit use of `std::cout`, `std::cerr`, `exit()`

Obsolete Features (2)

- Should we maintain a list of such features on wiki page?
 - Then when someone finds another old fashioned code it may be easier to address it in all examples (we have 82 of them !!)

Obsolete Features (3)

- `/vis/drawTracks` found at:
 - `./eventgenerator/exgps/src/exGPSEventActionMessenger.cc`
 - `./radioactivedecay/rdecay02/src/exrdmEventActionMessenger.cc`
 - `./optical/wls/src/WLSEventActionMessenger.cc`
 - `./electromagnetic/TestEm6/src/EventActionMessenger.cc`
 - `./electromagnetic/TestEm10/src/Em10EventActionMessenger.cc`
 - `./electromagnetic/TestEm12/src/EventActionMessenger.cc`
 - `./electromagnetic/TestEm2/src/EventActionMessenger.cc`
 - `./electromagnetic/TestEm18/src/EventMessenger.cc`
 - `./electromagnetic/TestEm16/src/EventActionMessenger.cc`
 - `./electromagnetic/TestEm11/src/EventActionMessenger.cc`
 - `./electromagnetic/TestEm5/src/EventMessenger.cc`
 - `./electromagnetic/TestEm1/src/EventActionMessenger.cc`
 - `./electromagnetic/TestEm4/src/EventActionMessenger.cc`
 - `./electromagnetic/TestEm3/src/EventActionMessenger.cc`
 - `./electromagnetic/TestEm7/src/EventActionMessenger.cc`
 - `./medical/fanoCavity2/src/EventActionMessenger.cc`
 - `./medical/electronScattering/src/EventMessenger.cc`
 - `./medical/fanoCavity/src/EventActionMessenger.cc`
 - `./field/field04/src/F04EventActionMessenger.cc`
 - `./field/field06/src/F06EventActionMessenger.cc`

Obsolete Features (4)

- `setCut` present in the following files:
 - `./radioactivedecay/rdecay02/src/exrdmPhysicsListMessenger.cc`
 - `./hadronic/Hadr01/src/PhysicsListMessenger.cc`
 - `./electromagnetic/TestEm0/src/PhysicsListMessenger.cc`
 - `./electromagnetic/TestEm12/src/PhysicsListMessenger.cc`
 - `./electromagnetic/TestEm2/src/PhysicsListMessenger.cc`
 - `./electromagnetic/TestEm18/src/PhysicsListMessenger.cc`
 - `./electromagnetic/TestEm15/src/PhysicsListMessenger.cc`
 - `./electromagnetic/TestEm17/src/PhysicsListMessenger.cc`
 - `./electromagnetic/TestEm11/src/PhysicsListMessenger.cc`
 - `./electromagnetic/TestEm13/src/PhysicsListMessenger.cc`
 - `./electromagnetic/TestEm14/src/PhysicsListMessenger.cc`
 - `./electromagnetic/TestEm5/src/PhysicsListMessenger.cc`
 - `./electromagnetic/TestEm11_MT/src/PhysicsListMessenger.cc`
 - `./electromagnetic/TestEm1/src/PhysicsListMessenger.cc`
 - `./electromagnetic/TestEm3/src/PhysicsListMessenger.cc`
 - `./electromagnetic/TestEm7/src/PhysicsListMessenger.cc`
 - `./electromagnetic/TestEm9/src/PhysicsListMessenger.cc`
 - `./medical/electronScattering/src/PhysicsListMessenger.cc`
 - `./medical/electronScattering2/src/PhysicsListMessenger.cc`
 - `./medical/GammaTherapy/src/PhysicsListMessenger.cc`
 - `./polarisation/Pol01/src/PhysicsListMessenger.cc`

Adding A New Example

- The steps to be followed (besides adding the example to its sub-category):
 - Update CMakeFile.txt, README, .README files **in the upper example directory**
 - Update files in examples/.doxygen:
 - Doxyfile, Doxymodules_category.h, [generate_standaloe.sh]
 - The last file has to be updated only if the example uses generic class names (without a specific prefix)
 - Update files in tests/ctest:
 - CMakeLists.txt GNUmakeTestfile.cmake
- The simplest way is just to add the new example in its sub-category and inform WG coordinator or deputy who will take care of the rest

AOB

- Proposal to remove analysis/A01 (Joseph)
 - The arguments for removal
 - The example was added to demonstrate the AIDA analysis
 - Only subset of the features demonstrated here is covered in g4tools
 - But
 - This example demonstrates various aspects of Geant4 application in still quite easy level
 - It is one of rare examples with non trivial geometry, accounting hits of both tracker and calorimeter type
 - We used this example scenario for our new tutorial in Orsay this year (but during the tutorial the participants added functionality step by step)
 - Proposal: transform it in basic/B5

AOB (cont.)

- The default starting conditions in all basic (extended) examples with migration to MT:
 - The default number of threads: a fixed value or `GetNumberOfCores` ?
 - Redirect thread output in files by default (couldn't this be rather the default in Geant4 kernel)?
 - `/control/cout/setCoutFile fileName ifAppend`
 - `/control/cout/setCerrFile fileName ifAppend`
 - Move `UImanager` at the beginning of `main()`
 - Needed for handling warnings/exceptions issued from detector construction and physics lists