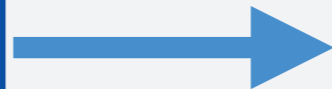


10



10.X

CMake for Geant4 10

Ben Morgan

Gunter Folger

Since Chartres...

- Install/reuse Data Libraries
- Allow C++ Standard selection
- Multithreaded build
- Bug fixes/tweaks

```
g4build — cc
ccmake
CMAKE_BUILD_TYPE Release
CMAKE_INSTALL_PREFIX /usr/local
CMAKE_OSX_ARCHITECTURES
CMAKE_OSX_DEPLOYMENT_TARGET
CMAKE_OSX_SYSROOT
GEANT4_BUILD_MULTITHREADED OFF
GEANT4_INSTALL_DATA OFF
GEANT4_INSTALL_DATADIR
GEANT4_USE_G3TOG4 OFF
GEANT4_USE_GDML OFF
GEANT4_USE_INVENTOR OFF
GEANT4_USE_OPENGL_X11 OFF
GEANT4_USE_QT OFF
GEANT4_USE_RAYTRACER_X11 OFF
GEANT4_USE_SYSTEM_CLHEP OFF
GEANT4_USE_SYSTEM_EXPAT ON
GEANT4_USE_SYSTEM_ZLIB OFF
GEANT4_USE_XM OFF

CMAKE_BUILD_TYPE: Choose the type of build
Press [enter] to edit option
Press [c] to configure
Press [h] for help Press [q] to quit
Press [t] to toggle advanced mode (Current mode: OFF)
```

CTest - Integration Testing

- **Integration testing set-up stable**
 - Updates to tested platforms, including MT builds
 - Streamlined scripts
- **Open Problems**
 - Still occasional problems with updates from SVN
 - Reliability of CDash server

CDash - Continuous and Nightly Testing

- **Shift system working well**
 - geant4tags to select/accept/reject tags
 - [CDash dashboard](#) for viewing test results
 - Edupad page for logging by shifter
- **Continuous builds help filter out “bad” tags quickly**
 - Reduced set of tags used to continuously test proposed and selected tags
 - ***You should check CDash Continuous after proposing a tag!***

Updates for 10.0

- **Default usage of all builtins:**
 - CLHEP, expat, zlib etc
- **Never build examples**
 - Just install source code
- **Documentation**

Geant 4

Forums
by
Categor
Forums
by Time
Order
Reques
a New
Forum

Show subscribers

This is a discussion of the installation and configuration of Geant 4 on various sites.

The email gateway for this forum is: installconfig-g4hn@s...

Inline Depth: 1 All Outline Depth: 1 2 All

1580 Illegal parameter (0) </vis/open OGL 600x600-0+

1 Re: Illegal parameter (0) </vis/open OGL 600x6

1579 warning on Configuration and fatal error for instal

1 Re: warning on Configuration and fatal error for

↳ Re: warning on Configuration and fatal error fo

↳ Re: warning on Configuration and fatal error fo

↳ Re: warning on Configuration and fatal error fo

↳ Re: warning on Configuration and fatal error fo

1578 geant4.10.0.b01 -- unrecognized #pragama GCC

GNUMake Support

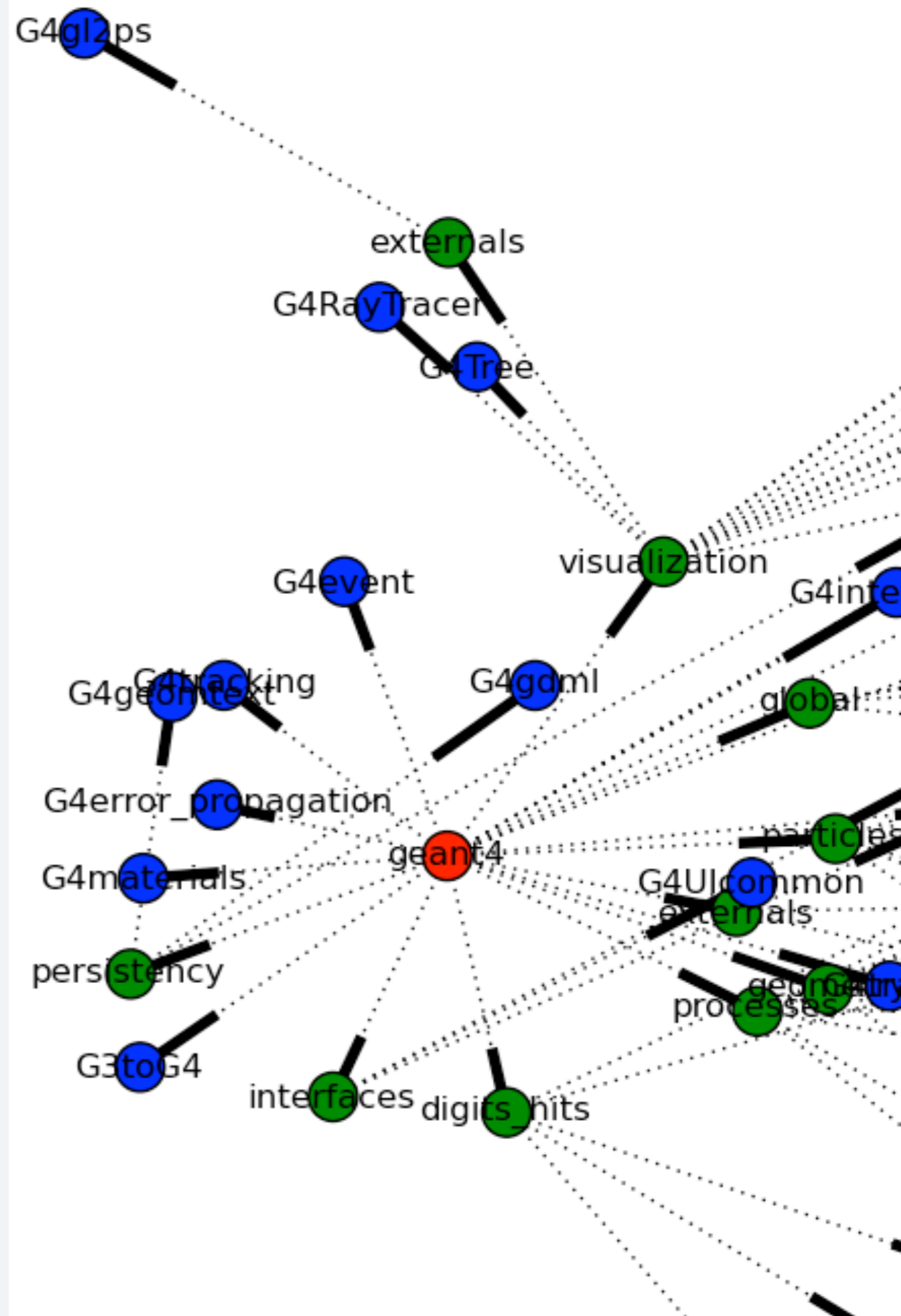
- Not retired in 10.0, but simplify system
- Demo available for discussion this week
 - Environment variables become Make variables.
 - One line change to User GNUmakefiles

```
Geant4GMake.gmk.in (~/.Sandbox/co...velopmentTools.git/Template
110 # Configuration of this Geant4GMake instance - Configured by CM
111 #-----
112 # - System Settings and Paths
113 $(call g4gmake_config_variable,G4VERSION,@Geant4_VERSION@)
114 $(call g4gmake_config_variable,G4SYSTEM,@GEANT4_SYSTEM@-@GEANT4
115 $(call g4gmake_config_variable,G4INSTALL,@GEANT4_INSTALL@)
116 $(call g4gmake_config_variable,G4INCLUDE,@GEANT4_INCLUDE@)
117 $(call g4gmake_config_variable,G4LIB,@GEANT4_LIB@)
118
119 # - Default G4WORKDIR - current working directory?
120 ifndef G4WORKDIR
121     G4WORKDIR := /tmp
122 endif
123
124 # - Datasets
125 $(call g4gmake_process_datasets,@GEANT4_DATASET_DESCRIPTIONS@)
126
127 # - Library build settings
128 # CLHEP
129 override G4LIB_USE_CLHEP := $(call g4gmake_cmake_bool,@GEANT4_U
)
130 ifdef G4LIB_USE_CLHEP
131     $(info -- Geant4 uses internal clhep)
132 else
133     $(info -- Geant4 uses system clhep)
134     override CLHEP_INCLUDE_DIR := @CLHEP_INCLUDE_DIR@
135     override CLHEP_LIBDIR := @CLHEP_LIBDIR@
136 endif
137
138 # EXPAT
139 override G4LIB_USE_EXPAT := $(call g4gmake_cmake_bool,@GEANT4_U
)
140 ifdef G4LIB_USE_EXPAT
141     $(info -- Geant4 uses internal expat)
Geant4GMake.gmk.in[make]
```

Geant4/CMake Proposed 2014 Development

Developer support

Library modularization



jira-geant4.kek.jp/browse/DEV-81 — [DEV-81] Improve CMake API for, and modularization of, Geant4 Categories – Geant4 Requirements Tracker

[DEV-81] Improve CMake API for, and modularization of, Geant4 Categories – Geant4 Requirements Tracker Installation and Configuration

Development / DEV-81

Improve CMake API for, and modularization of, Geant4 Categories

Edit Comment Assign More Start Progress Resolve Issue Workflow

Details

| | | | |
|--------------------|--|-----------------|-----------------------------------|
| Type: | Task | Status: | Open (View Workflow) |
| Priority: | Major | Resolution: | Unresolved |
| Affects Version/s: | 10.0 | Fix Version/s: | 10.0 |
| Component/s: | Code Reviews and Improvements, ... (2) | Security Level: | Developers only (Developers only) |
| Labels: | None | | |
| Environment: | All | | |

People

Assignee: Ben Mor
 Reporter: Ben Mor
 Votes: 0 Vote for
 Watchers: 4 Stop wat

Dates

Due: 20/Sep/13
 Created: 10/Jul/13 3:3
 Updated: 22/Jul/13 12:

Agile

[View on Board](#)

Description

The current "sources.cmake" file mechanism for developers to declare the sources/resources and dependencies of their code in Geant4's CMake system requires duplicate information to be provided, and could be more coherent. The main issues are outlined here:

<https://indico.cern.ch/contributionDisplay.py?sessionId=2&contribId=79&confId=199138>

Improvements here need to cover these issues, and also address the need for a better modularization of the Geant4 libraries. This latter issue comes from the user requirement to be able to switch off certain physics processes/models at build time. A further benefit is to maximize coherence of each component library whilst minimizing dependencies.

Neither the known granular (too many decoherent libraries) nor global (too few large libraries) builds provide a singular solution, but a dual mode build will not be supported due to time limits.

Implementing a new scheme first requires an analysis of the dependency graph of the Geant4 granular libraries. The aim here is to identify:

- 1) Libraries that may benefit from merging
- 2) Libraries that may benefit from splitting
- 3) Direct dependencies of each library to reduce overlinking
- 4) Public and private headers of each library

What do YOU want from the CMake system?

Geant4 Development Pocket Guide Draft

Ben Morgan

Friday 20th September, 2013

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Geant 4

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Code Management

This is a quick-reference guide for Geant4 developers who need to access to the Geant4 SVN repositories.

Please also look at the [Tag & Release Policy document](#) for Geant4.

For a more exhaustive tutorial on SVN, see documentation you find from the original SVN documentation.

The Geant4 SVN repositories are located on the svn server `svn.cern.ch`. There are `g4tests`, and Geant4-related tools (in `g4tools`). The repository is accessible only by Geant4 collaborators after signing-in once a year to confirm their [Collaboration membership](#). If you do not have access to the form, contact your working group coordinator to get you onto the list of collaborators.

1. [The GEANT4 SVN repository structure](#)
2. [Browsing the Geant4 svn repository](#)
3. [How to setup and access the repository](#)
4. [Checkout and update the code](#)
 1. [Checkout of User Documentation](#)
5. [Viewing changes and resolving conflicts](#)
6. [Committing changes to the repository](#)
7. [Tagging and versioning](#)
8. [Useful SVN commands](#)
9. [Information on svn](#)
10. [Where to find released source code](#)

1. The Geant4 code and SVN repository structure

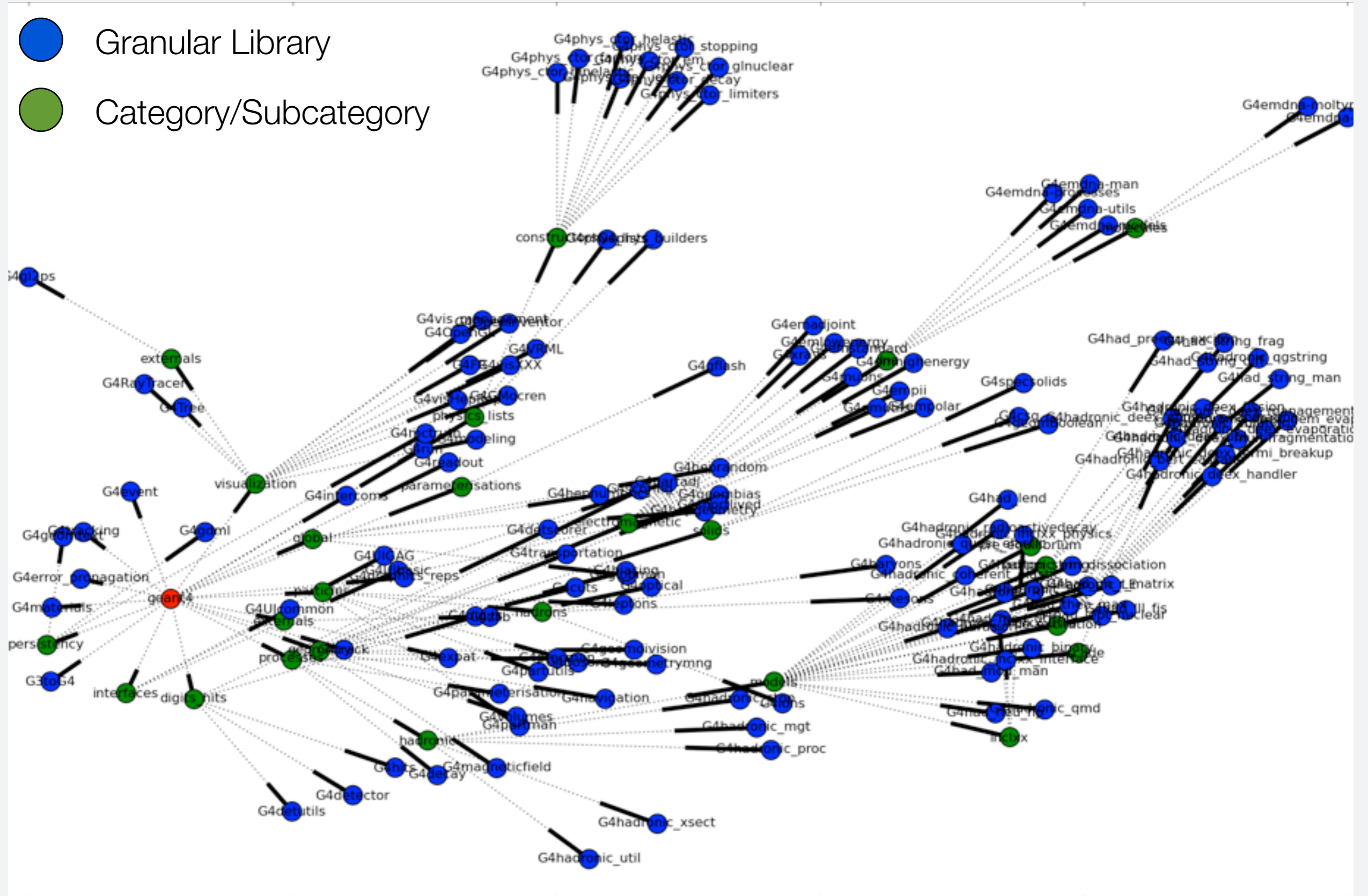
The Geant4 source is actually structured in the source directory under `geant4` in a tree structure. The source is distributed according to each sub-domain.

The sub-domain `global` is a place holder for all the development done which affects all sub-domains. The `include` directories contain header files (`.hh`) and inline functions definition files (`.icc`); the `tests` sub-domain, to test the code under distinct conditions.

The Geant4 `code` repository has three top level directories, `trunk`, `tags`, and `branches`.

Do you want more documentation?

- Granular Library
- Category/Subcategory



How best to organise and build these libraries?
Ease of maintenance, development and performance

Granular

Too Many

Global

Too Big

Merge

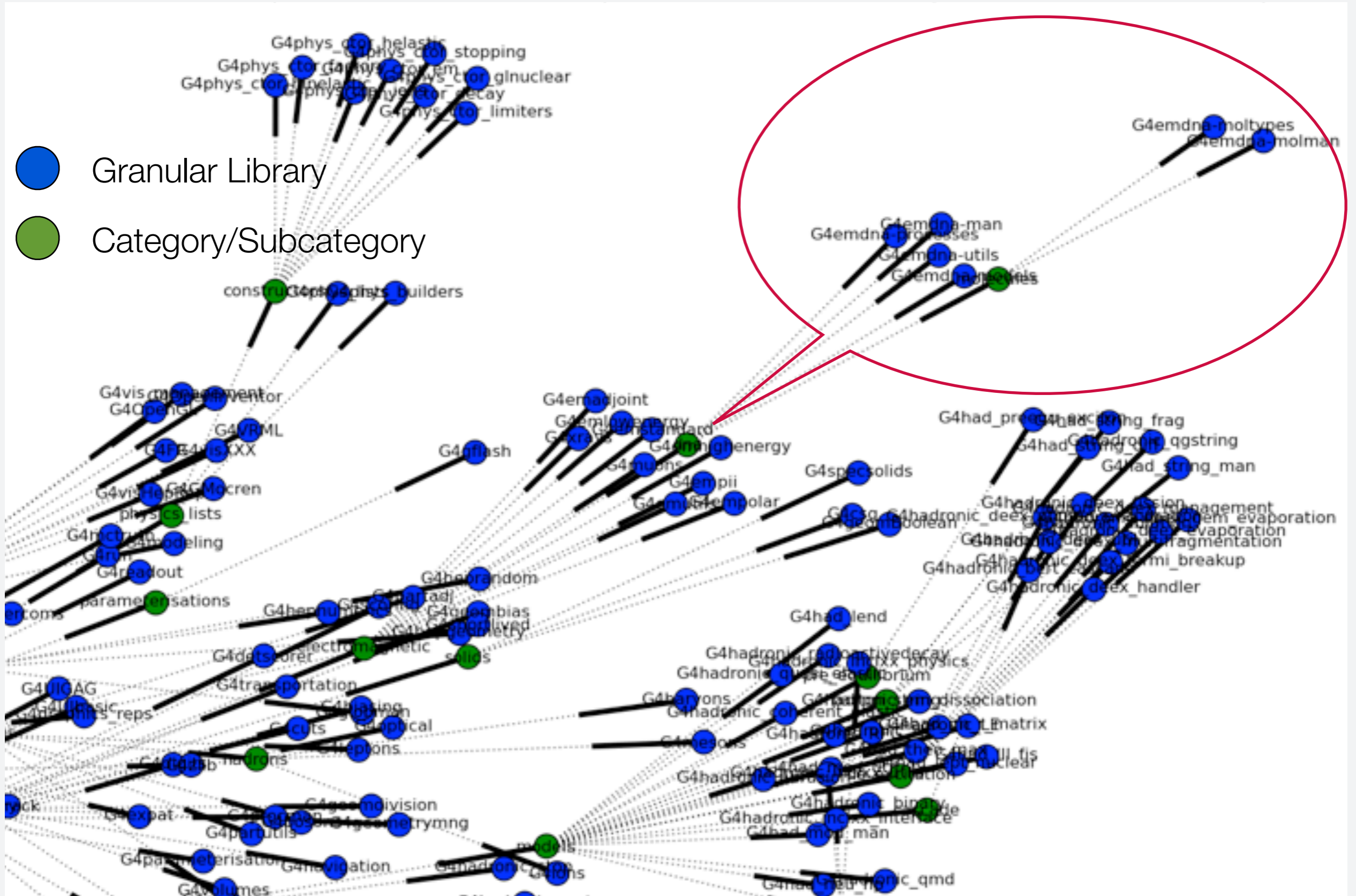


Optimum



Split

Our current solutions are suboptimal, and make life difficult for you



Example: DNA

Not always required, BUT, are 6 libraries really needed when it is?

3205

headers

986

private to granular
library
(estimate)

1983

detail of granular
library
(estimate)

Hide headers of implementation details - Cleaner Public API

A Quick Summary

- **CMake and Testing on course for 10.0 Release**
 - Please let Software Management of any further requirements ASAP!
- **Discuss CMake updates for 10.0**
 - CMake defaults for user installs.
 - Legacy GNUmake support
- **Discuss proposed modularization work for 2014**
 - **This covers the whole toolkit, so your input is crucial**