

# *Merging Geant4-MT to the main development trunk and deadlines*

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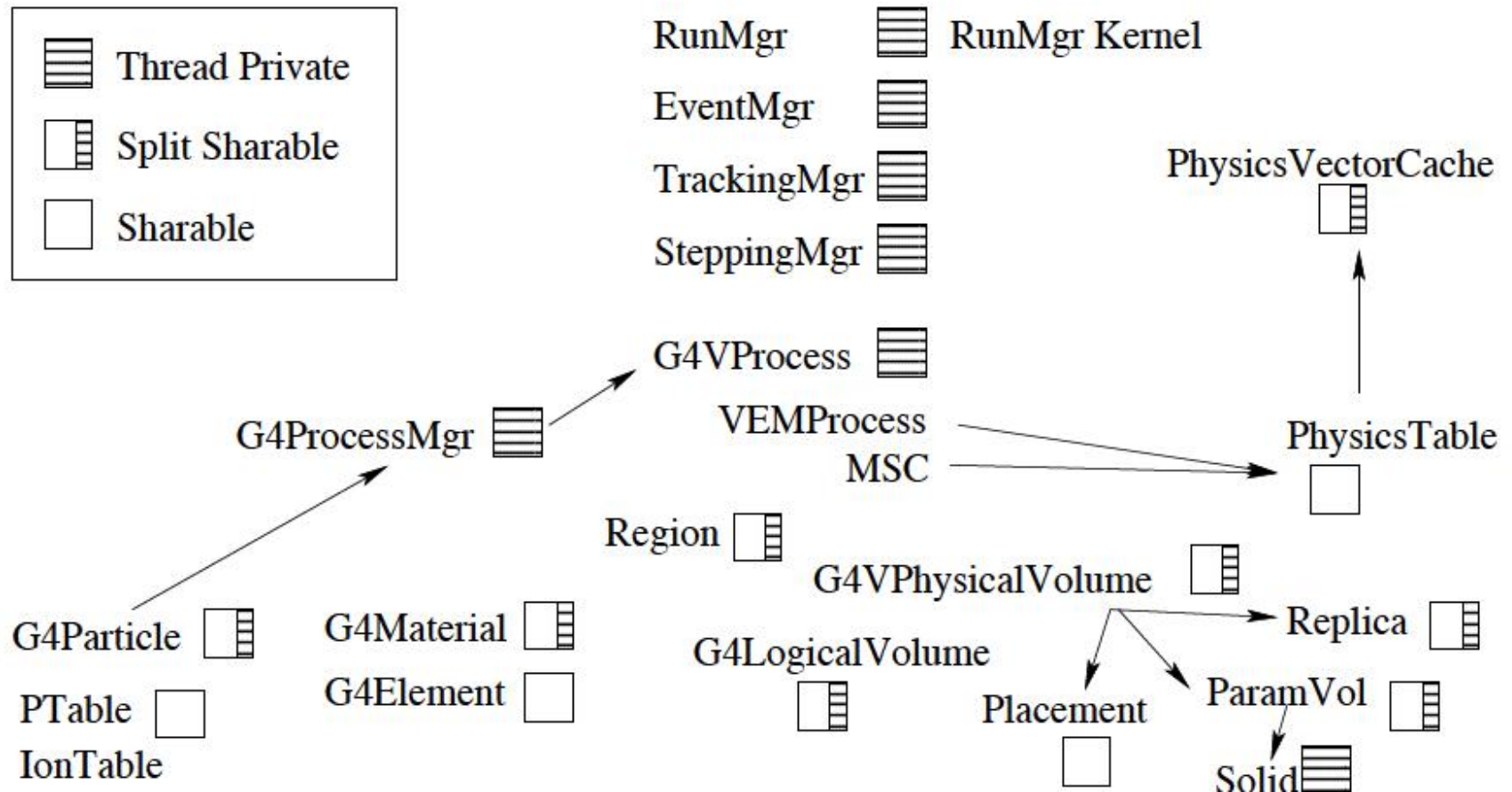
# Towards Geant4 version X

- The release in 2013 will be a major release
  - New functionalities and interface changes are allowed
  - Classes and codes declared obsolete can be removed
  - Discussion on Plenary 8
- Will incorporate **multi-threading capability**
  - Will require user-code migration to exploit this feature
  - Details in following Makoto's talk
- Will offer **two build options**
  - Multi-threaded mode (including single thread) - default
  - Sequential mode
    - To allow user with code depending on thread-unsafe external libraries to still use the new version
    - To facilitate migration and porting of features

# Merging Geant4-MT features

- Import and integrate Geant4-MT utilities code
  - Translate relevant code to C++
  - Encapsulate global data and functions to utility classes
  - Inspect code and module dependencies
  - Generalize use/activation of thread-local-storage (TLS) for porting on supported platforms
- Implement thread-safety for sharable classes, thread-private data and volatile class members
  - Where possible, investigate possibility to modify existing code for thread safety (improper use of static/const or mutable variables)
  - Proper implementation of TLS for global and static variables
- Provide utilities and minimize exposure of thread-specific code in user classes

# Geant4MT Sharable Classes



# Timeline

- Geant4 9.6 release on November 30
  - Final release of version 9 series
  - Must already include “obsoleting” messages for functionalities planned for removal in the major release of 2013
  - Can already include first changes for thread-safety
- December 2012 / January 2013
  - Conversion of release 9.6 to new Geant4-MT prototype
  - Adiabatically integrate Geant4-MT 9.6 features to main development trunk
    - Developments toward version X will be made to main trunk as usual
    - Patches to release 9.6 will be included in dedicated SVN branch
- February - May 2013
  - Adaptation of system testing and CMake build system
  - Migration of relevant examples and tests
  - Stress tests for CPU and physics performance
- June 2013
  - Beta release: all changes for multi-threading and interfaces should be included
- December 2013
  - Final release

# Beta release features

- Removal of obsolete classes/methods
  - All classes/methods to be removed must have **warning message** for obsoleting in release 9.6, and must be noted in the release notes
  - Changes/removals will have to be applied in SVN main development trunk soon after 9.6 release, so that they won't be converted into Geant4-MT
- Interface changes related to multi-threading
  - Must be established/finalized by February 2013 prior migration of examples & tests
  - Existing features will have to be thoroughly verified and tested
- New features independent of multi-threading
  - Should make sure they run in multi-thread mode
  - If affecting many examples/tests, communicate with the SB to coordinate the migration. No "last-minute" big committals will be allowed
  - Committed directly to the multi-threaded development trunk for version X

Note: In addition to stress tests for multi-threading, the Beta release should also have a reasonable number of migrated examples to demonstrate MT features and new user interfaces

# After Beta release ...

- Feedback from our customers and users will be essential
  - To review/refine and eventually improve the API
  - To spot problems or use-cases not considered
- All examples being released will have to migrate to the new API and guarantee to work also in sequential mode
- Documentation will be updated accordingly
- Staging ...
  - As usual, new features/classes may be added at any minor release as long as they won't cause user's migration. Thus any functionality, which we currently have but cannot catch up necessary interface changes or assuring thread safety, may be staged as long as we release base interfaces with version X

# Questions ...