

# Architecture review

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# Background

- Geant4 kernel was designed and implemented in 1995-1997.
  - A few major revisions since then
    - Migration to STL, Cuts per region, Dynamic instantiation of particle definition, Parallel world
  - Also a few medium level revisions
    - Error propagation, Regular navigation, Reverse Monte Carlo, Model-approach of EM processes
- Such revisions and another new requirements (e.g. multi-thread/multi-core/GPU, speed) suggest the need of architecture review.

# Architecture

- Major design pattern
  - E.g. track is a passive object
- Categorization and relation between categories
  - E.g. use-relation between classes
- Key classes used by many classes and/or affecting heavily to performance
- Major interfaces (signatures)
  - Both internal between categories and exposed to user
- External dependencies

# Architecture review

- Note:
  - This is a review, not a real architecture revision.
- Scope:
  - Review Geant4 architecture to identify the places that need revisions.
  - Prioritize revisions and estimate costs (in time and resource).
  - Create work plan and propose to SB by summer 2010.
    - Major discussion item of next collaboration meeting
- Review team:
  - SB will appoint the review team.

# Architecture revision

- Actual projects are foreseen to start in 2011.
  - Follow the planned and agreed prioritization and resource allocation.
- The majority of the collaboration's effort will be still on maintaining/upgrading the current Geant4 series.
  - We cannot abandon current versions (and users) until the new series becomes mature for production-level use.