

# Multi-Threading in ROOT

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ROOT

Data Analysis Framework

<https://root.cern>



- ▶ TBB is used as the basis to provide explicit and implicit multi-threading in ROOT
- ▶ TBB calls are a hidden, localized implementation detail. They are present in the following ROOT classes:
  - TPoolManager (pool of threads)
  - TThreadExecutor (parallel map/reduce)
  - TTaskGroup (group of tasks)
- ▶ These classes are mostly used by ROOT itself (rarely by users)
- ▶ This design would allow to plug in other backends
  - E.g. PoC for HPX: <https://github.com/root-project/root/pull/5364>



# TBB API Deprecation and Plans

▶ The TBB features that we currently use in ROOT are:

ROOT class	TBB feature used	Intel's recommendation
TThreadPoolManager	<code>task_scheduler_init</code>	task_arena, global_control
TThreadExecutor	<code>parallel_for</code> , <code>parallel_reduce</code>	-
TTaskGroup	<code>task_group</code>	-

▶ Plans:

- Proceed with the changes as [Intel recommends](#) ([PR](#))
- ROOT currently sees no need to migrate to other technologies for the MT backend (although we could, if need be)