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Task Force on Core Software (TFCS)

The Task Force on Core Software (TFCS) was formed in April 2016 to tackle the issues related to the framework, event model, non-event data for the software and computing upgrade.

Members of the TFCS are : Roel Aaij, Concezio Bozzi, Marco Cattaneo, Marco Clemencic, Ben Couturier, Hadrien Grasland, Benedikt Hegner, Rosen Matev, Sebastien Ponce, Gerhard Raven, Stefan Roiser, Henry Schreiner, Andrea Valassi. Members of the Parallelization Working Group and the Upgrade Reconstruction Task Force also contribute to the TFCS activities.

The work to be done is organized in a set of JIRA tasks [☞](#) (label is "LHCbUpgrade")

A computing infrastructure has been setup, based on git and gitlab

A nightly build [☞](#) is available, the associated slot is defined as lhcb-future The instructions to setup and run the code are available here [☞](#).

The first hackathon of the TFCS has been held within the 7th Computing Workshop on May 26-27th 2016. The JIRA tasks hacked during this hackathon are related to (click on link to view):

- data- and control-flow [GAUDI-1206 ☞](#), [GAUDI-1132 ☞](#)
- event model [GAUDI-1207 ☞](#)
- multi-threading [GAUDI-1208 ☞](#)

The second hackathon [☞](#) was held on July 7-8, 2016.

The third hackathon [☞](#) was held on September 19-20, 2016. The outcome of this hackathon included

- unifying prescaler classes in order to de-duplicate code
- extending Ranges for the use of DataHandles
- work on HitContainers: clean-up and factorization of indexes, replacement of non thread-safe code
- new KalmanFilter code being integrated into master and, in parallel, being ported to the future branch , as an exercise of porting a complicated algorithm
- defining a proposal for implementing conditions in Gaudi, that will be presented at the Gaudi workshop (Sep 21-23)
- fixing basic multithreaded tests of Brunel: a first bug involving memory corruption has been tackled, now the scheduling seems to not respect data dependencies (work in progress)

The scheduling has issues taking benefit of reentrant algorithms (it never schedules more that one at a time) For next hackathon, one should work on data composition, that was not really tackled in the hackathon.

Merge requests in Gaudi can be monitored here [☞](#).

The fourth hackathon [☞](#) was held on November 15-17, 2016 in Paris, as part of the 8th LHCb Computing Workshop. The target was to spread the knowledge on the new LHCb framework to the collaboration. It thus included some tutorials on Gaudi, C++ and the new framework. The attendance has been exceptional with more than 30 people on average despite the parallel sessions. The list of topics worked on is thus equally long :

- how to deal with log files when running parallel Gaudi
- plans on improving Gaudi for online usage
- how to deal with conditions in parallel environment
- rich reconstruction on KNL
- SoA containers

- moving PrLongLiveTracking to new framework
- moving MuonId to new framework
- moving Seeding to new framework
- moving upstream tracker to new framework
- running rich on FPGA
- moving TrackBestTrackCreator & kalman filters to new framework
- moving PatVeloTT to new framework
- use docker for analysis and data preservation
- work on new geometry
- work on packers in the new framework
- fix Producer algorithm and add an example for it in Gaudi
- moving PrPixel to new framework
- write an example to test parallel root I/O in hive and fix it
- work on the Rich framework
- getting rid of FTClusters, working FtClusterCreator in the new framework
- moving TrackEventFitter to the new framework
- moving CombineParticleMaker to new framework
- think about multi event algorithms
- MiniBrunel Debugging
- LLT Muon in the new framework
- making PropertyConfigSvc thread safe

Meetings, mailing list

The TFCS meets every two weeks on Mondays, alternating in either specific meetings [or](#) during General meetings of the software and computing upgrade [or](#).

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