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Optimization of the HLT Resource Consumption in the LHCb Experiment

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Today's computing elements for software based high level trigger processing (HLT) are based on nodes with multiple cores. Using process based parallelisation to filter particle collisions from the LHCb experiment on such nodes leads to expensive consumption of read-only memory and hence significant cost increase. In the following an approach is presented to fork multiple identical processes from a master process. This approach facilitated to minimize the resource consumption of the filter applications and to reduce the startup time. Described is the duplication of threads and the handling of files open in read-write mode when duplicating filter processes and the possibility to bootstrap the event filter applications directly from preconfigured checkpoint files. Emphasis was put on the condition, that the trigger code itself is agnostic to this process. The approach led to a reduced memory consumption of roughly 60 % in each worker node of the LHCb HLT farm and an overall reduced startup time of roughly 70 %.

Student? Enter 'yes'. See <http://goo.gl/MVv53>

no

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