

# First experiences with a parallel architecture testbed in the LHCb trigger system

*Thursday, 13 October 2016 12:00 (15 minutes)*

In view of Run3 (2020) the LHCb experiment is planning a major upgrade to fully readout events at 40 MHz collision rate. This in order to highly increase the statistic of the collected samples and go further in precision beyond Run2. An unprecedented amount of data will be produced, which will be fully reconstructed real-time to perform fast selection and categorization of interesting events. The collaboration has decided to go for a fully software trigger which will have a total time budget of 13 ms to take a decision. This calls for faster hardware and software.

In this talk we will present our efforts on the application of new technologies, such as GPU cards, to LHCb trigger system. During Run2 a node equipped with a GPU has been inserted in LHCb online monitoring system; during normal data taking, a subset of real events is sent to the node and processed in parallel by GPU-based and CPU-based track reconstruction algorithms. This gives us the unique opportunity to test the new hardware and the new algorithms in a realistic environment.

We will present the setup of the testbed, the algorithms developed for parallel architectures and discuss the performance compared to the current LHCb track reconstruction algorithms.

## Secondary Keyword (Optional)

Trigger

## Primary Keyword (Mandatory)

Parallelization

## Tertiary Keyword (Optional)

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