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A Monitoring System for the LHCb Dataflow

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LHCb is one of the experiments acquiring physics data from the collisions in the Large Hadron Collider, specialized in b-physics. To be able to control and monitor the large quantity of devices of the experiment, the system makes use of a Finite State Machine tree that propagates states and commands, letting the operators easily know what the current state of the experiment is. This, however, means some symptoms in the dataflow are hidden and thus a need for a monitoring system that would overview the whole DAQ architecture was identified. The dataflow monitoring system is implemented in the experiment's SCADA (WinCC-OA), making use of its distributed database as well as of DIM (Distributed Information Management system) to collect all the information necessary about the Dataflow. The input for this system is generated at the Readout cards, the processing farm and the storage units, which are all equipped with trigger or event counters. The tool also provides historic navigation and trending capabilities to aid in debugging issues and it also generates input to the central alarm system so the users can be warned of existing problems and quickly react to fix them, in order to keep the experiment running at maximum efficiency. The tool has been under operation during Run 2 and has been evolving according to the feedback of users and experts.

Author: VIANA BARBOSA, Joao Vitor (FCT Fundacao para a Ciencia e a Tecnologia (PT))

Co-authors: JOST, Beat (CERN); GASPAR, Clara (CERN); FRANK, Markus (CERN)

Presenter: VIANA BARBOSA, Joao Vitor (FCT Fundacao para a Ciencia e a Tecnologia (PT))

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