Contribution ID: **31** Type: **remote**

32 Tb/s DAQ for the LHCb experiment at CERN

Tuesday 9 February 2021 10:10 (30 minutes)

The currently-commissioned LHCb data acquisition system for Run3 will collect data in runtime at 32 Tbit/s. The new version of the customized cluster will implement a fully software-defined selection of uncompressed FPGA streams. The principle of LHCb's operation enforces all-to-all lossless communication to assemble scattered data for further real-time selection. The cost-optimized architecture consists of the network and the servers that operate at close-to-the-link and close-to-the-memory-throughput capacity. The aim is to ultimately output into storage heavily compressed events at a much-reduced throughput of 1 Gigabit per second. This talk presents the most important development and commissioning decisions and lessons learned along the road. Topics of front-end FPGAs, tested networks, evaluation-based choice of hardware, and commissioning are covered.

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Session Classification: Main session