Contribution ID: **385**　　　　　　　　　　　　　　　　　　　　　　　Type: **Parallel**

Operational experience with the CMS Data Acquisition System

Monday 21 May 2012 16:35 (25 minutes)

The data-acquisition (DAQ) system of the CMS experiment at the LHC performs the read-out and assembly of events accepted by the first level hardware trigger. Assembled events are made available to the high-level trigger (HLT), which selects interesting events for offline storage and analysis. The system is designed to handle a maximum input rate of 100 kHz and an aggregated throughput of 100 GB/s originating from approximately 500 sources and 10ˆ8 electronic channels. An overview of the architecture and design of the hardware and software of the DAQ system is given. We report on the performance and operational experience of the DAQ and its Run Control System in the first two years of collider run of the LHC, both in proton-proton and Pb-Pb collisions. We present an analysis of the current performance, its limitations, and the most common failure modes and discuss the ongoing evolution of the HLT capability needed to match the luminosity ramp-up of the LHC.

Summary

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Session Classification: Online Computing

Track Classification: Online Computing (track 1)