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Infrastructures and installation of CMS DAQ

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At the time of this paper, all hardware elements of the CMS Data Acquisition System have been installed and commissioned both in the underground and surface areas. This paper describes in detail the infrastructures and the different steps that were necessary from the very beginning when the underground control room was only a building yard to a working system collecting data fragment from ˜650 sources and sending them to surface for assembly and analysis.

Summary

The data acquisition system for CMS is divided into an underground part and a surface part.

The underground part performs the following functions:
- Front End data collection over 650 sources and transmission to the surface on-line computing farm.
- Front End status collection and elaboration of a smart back pressure signal preventing the overflow of the Front End electronic.

The surface part performs the event building (640 event fragments assembled into a single event of ˜1MB) and later-on, the on-line analysis to select the events to be stored for off-line analysis.

Year 2005 has been dedicated to the production/test of the custom made electronic boards and the procurement of the commercial items needed to operate the underground part of the Data Acquisition System of CMS.
The first half of 2006 has been spent to install the DAQ infrastructures in USC55 and to prepare the racks to receive the hardware elements.
The second half of 2006 was dedicated to the installation and cabling of the CMS DAQ elements in the underground control rooms.
Concurrently, the infrastructures in the surface building were installed and cabling of the computer room started early 2007.
The event builder PCs have been installed and commissioned this summer. They will act also as event analyzers as long as the data volume does not require dedicated PCs to run the high level trigger algorithms. It is foreseen to procure and install analyzer PCs in the second half of 2008.

Author: Dr RACZ, Attila (CERN)

Presenter: Dr RACZ, Attila (CERN)

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