

THE DATAFLOW SYSTEM OF THE ATLAS DAQ AND EVENT FILTER PROTOTYPE "-1" PROJECT

G. Ambrosini et al., CERN - Bogazici University - University Of Bern (Atlas Collaboration)

The final design of the Data Acquisition (DAQ) and Event Filter (EF) system for the ATLAS experiment at the LHC is scheduled to start not earlier than 1999. Clear specification of the detector requirements, further technology investigation of hardware and software elements and integration studies are still required to reach maturity for the design. The ATLAS DAQ Group has chosen to approach such pre-design investigations via a structured prototype, supporting the evaluation of hardware and software technologies as well as their system integration aspects. A project has been proposed and approved by the ATLAS Collaboration for the design and implementation of a full DAQ/EF prototype, based on the Trigger/DAQ architecture described in the ATLAS Technical Proposal and supporting studies of the full system functionality, although obviously not the required final performance. For this reason, it is referred to as ATLAS DAQ Prototype "-1". The prototype consists of a full "vertical" slice of the ATLAS DAQ/EF architecture, including all the hardware and software elements of the data flow, its control and monitoring as well as all the elements of a complete DAQ system, from the detectors Read Out Driver to data recording. This paper describes the dataflow component, its design, implementation and performance. The architectural view of the system and details of its components are described, namely: - the Front End DAQ, consisting of the Read Out Buffer, the local data collection unit, the interface to the Event Builder and the local DAQ for the control and monitoring - the Event Builder, consisting of suitable switching technology supporting high rate parallel data transmission - the Sub-farm DAQ, providing data flow support to the processor farms running an online implementation of the standard ATLAS reconstruction and physics analysis applications. The activities planned for the use and further development of the dataflow system will also be highlighted.