Contribution ID: **13**   Type: **Oral presentation**

FELIX: commissioning the new detector interface for the ATLAS trigger and readout system

Monday 12 October 2020 14:40 (20 minutes)

After the current LHC shutdown (2019-2021), the ATLAS experiment will be required to operate in an increasingly harsh collision environment. To maintain physics performance, the ATLAS experiment will undergo a series of upgrades during the shutdown. A key goal of this upgrade is to improve the capacity and flexibility of the detector readout system. To this end, the Front-End Link eXchange (FELIX) system has been developed. FELIX acts as the interface between the data acquisition; detector control and TTC (Timing, Trigger and Control) systems; and new or updated trigger and detector front-end electronics. The system functions as a router between custom serial links from front end ASICs and FPGAs to data collection and processing components via a commodity switched network. The serial links may aggregate many slower links or be a single high bandwidth link. FELIX also forwards the LHC bunch-crossing clock, fixed latency trigger accepts and resets received from the TTC system to front-end electronics. FELIX uses commodity server technology in combination with FPGA-based PCIe I/O cards. FELIX servers run a software routing platform serving data to network clients. Commodity servers connected to FELIX systems via the same network run the new multi-threaded Software Readout Driver (SW ROD) infrastructure for event fragment building, buffering and detector-specific processing to facilitate online selection. This presentation will cover the design of FELIX and the results of the installation and commissioning activities for the full system in spring 2020.

Minioral

Yes

IEEE Member

No

Are you a student?

No

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Session Classification: Oral presentations DAQ01

Track Classification: Data Acquisition System Architectures