

Readout software for the ALICE integrated Online-Offline (O2) system

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ALICE (A Large Ion Collider Experiment) is a heavy-ion detector studying the physics of strongly interacting matter and the quark-gluon plasma at the CERN LHC (Large Hadron Collider). During the second long shut-down of the LHC, the ALICE detector will be upgraded to cope with an interaction rate of 50 kHz in Pb-Pb collisions, producing in the online computing system (O2) a sustained input throughput of 3 TB/s.

The readout software is in charge of the first step of data-acquisition, handling the data transferred from over 8000 detector links to PCs memory by dedicated PCI boards, formatting and buffering incoming traffic until sent to the next components in the processing pipeline. On the 250 readout nodes where it runs, it has to sustain a throughput which can locally exceed 100 Gb/s.

We present the modular design used to cope with various data sources (hardware devices and software emulators), integrated with the central O2 components (logging, configuration, monitoring, data sampling, transport) and initiating the online data flow using the standard O2 messaging system. Performance considerations and measurements are also discussed.

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