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Streaming DAQ software prototype at J-PARC hadron experimental facility

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In recent years, particle physics and nuclear physics experiments require faster data collection systems and advanced trigger systems as the beam intensity increases. The current DAQ system at the J-PARC hadron experimental facility (HEF) uses a fixed- and low-latency trigger with dedicated hardware to reduce data and event-building software that merges data into a single endpoint. This conventional DAQ system is expected to be inadequate for the requirement of future experiments and has to be replaced with a new simplified but powerful one, called streaming DAQ, which collects the whole detector signals and filters them by software running on many computers. Therefore, we have developed a prototype of streaming DAQ software for the J-PARC HEF using FairMQ and Redis as middleware. The key features are that it is simple and has a low learning cost to develop and operate by a small number of people. The software can be used not only in a fully streaming readout system but also in the triggered DAQ and the combined DAQ of the hardware and software trigger. This contribution will discuss the software architecture, performance evaluation, and application in ongoing and future experiments.

Minioral

Yes

IEEE Member

No

Are you a student?

No

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