Dataflow: current and future data-transmission applications in the data-acquisition systems at the LHC

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Abstract

Following an introduction to the data-acquisition principles and architectures, the peculiarities and challenges of data-acquisition at the LHC will be discussed. This will provide the needed bases to review the current and future architectures. Particular emphasis will be put in explaining the data-transmission or *dataflow* systems. These are typically implemented as heterogeneous distributed systems, including high-performance off-the-shelf computing, networking and storage coupled with custom electronics and serial links, as driven by the experimental environment and constraints.
The design choices of the current architectures will be discussed before introducing the upcoming challenges driven by the LHC and experiment upgrade programs. How to deal with these and what new technologies can be used will be the last argument of the lecture.