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A novel dynamic event data model using the Drillbit column store

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The focus in many software architectures of the LHC experiments is to deliver a well-designed Event Data Model (EDM). Changes and additions to the stored data are often very expensive, requiring large amounts of CPU time, disk storage and man-power. At the ATLAS experiment, such a reprocessing has only been undertaken once for data taken in 2012.

However, analysts have to develop and apply corrections and do computations after the final official data processing or re-processing has taken place. The current practice at ATLAS is to distribute software tools to apply these corrections at analysis runtime, requiring any necessary input data to be present and manually supplied to the tool, and requiring manual application of the tool output to the event data by each analyst.

This approach has proven to be very expensive in terms of man-power, especially since verifying that the tools have been applied correctly (or at least consistently) is very time consuming.

Drillbit enables dynamic addition of event data, stored in and read from external files. This would make it possible to forego a fixed EDM class structure and instead collate validated variables and objects in a dynamically defined event. Corrections could be computed once or twice by experts, versioned, and then made available to others directly.

The technical basis for this architecture is currently being prototyped, and initial versions of the underlying Drillbit column store are available.

Summary

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