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Schema Evolution and the ATLAS Event Store

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The ATLAS event data model will almost certainly change over time. ATLAS must retain the ability to read both old and new data after such a change, regulate the introduction of such changes, minimize the need to run massive data conversion jobs when such changes are introduced, and maintain the machinery to support such data conversions when they are unavoidable. In database literature, such changes to the layout of persistent datastructures are known as schema evolution. Possible schema changes range from simple alterations (e.g., adding a new data member) through complex redesign of a class to multi-class refactoring of the data model.

ATLAS uses POOL/ROOT as its principal event storage technology and benefits from ROOT automatic schema evolution. For more complex changes, manual schema evolution is implemented. The architecture of the Gaudi/Athena framework separates the transient and persistent worlds by a "conversion" layer. We take advantage of this separation to allow transformations from stored persistent shapes to an evolving transient class. ROOT custom streamers may be used to allow migration to an intermediate state representation model.

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