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Modernising ATLAS Software and Metadata

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ATLAS has embarked on a major program of development in its offline software framework and the indexing of the data. In this paper we outline the motivations for such major changes, based on expected CPU evolution in the next decade, the increasing need to use memory more efficiently, and the increase of data volume expected for the LHC Run 3. The offline software framework, Athena will develop into a new multithreaded version, AthenaMT. We describe the changes that have been implemented to deal with concurrency in terms of data flow within an event, restructuring of framework components for thread safety and how to handle non-event data, such as detector conditions. We also describe how ATLAS moved to the git source control system to allow a continuous integration and code review to maintain software quality. ATLAS produces over 50 PByte of data and simulation every year, these data need to be curated over their lifetime to allow discovery and retrieval, and to maintain their accessibility and analysability over time. We discuss the metadata infrastructure developed by the ATLAS collaboration to characterise these data at the event, dataset and container level, and its expected evolution for Run 3.

Experimental Collaboration

ATLAS

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