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How To Review 4 Million Lines of ATLAS Code

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As the ATLAS Experiment prepares to move to a multi-threaded framework (AthenaMT) for Run3, we are faced with the problem of how to migrate 4 million lines of C++ source code. This code has been written over the past 15 years and has often been adapted, re-written or extended to the changing requirements and circumstances of LHC data taking. The code was developed by different authors, many of whom are no longer active, and under the deep assumption that processing ATLAS data would be done in a serial fashion.

In order to understand the scale of the problem faced by the ATLAS software community, and to plan appropriately the significant efforts posed by the new AthenaMT framework, ATLAS embarked on a wide ranging review of our offline code, covering all areas of activity: event generation, simulation, trigger, reconstruction. We discuss the difficulties in even logistically organising such reviews in an already busy community, how to examine areas in sufficient depth to learn key areas in need of upgrade, yet also to finish the reviews in a timely fashion.

We show how the reviews were organised and how the ouptuts were captured in a way that the sub-system communities could then tackle the problems uncovered on a realistic timeline. Further, we discuss how the review influenced overall planning for the ATLAS Run3 use of AthenaMT and report on how progress is being made towards realistic framework prototypes.

Tertiary Keyword (Optional)

Software development process and tools

Secondary Keyword (Optional)

Algorithms

Primary Keyword (Mandatory)

Parallelization

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