Contribution ID: **61** Type: **Oral**

Using OpenMP for HEP Framework Algorithm Scheduling

Monday 4 November 2019 11:45 (15 minutes)

The OpenMP standard is the primary mechanism used at high performance computing facilities to allow intra-process parallelization. In contrast, many HEP specific software (such as CMSSW, GaudiHive, and ROOT) make use of Intel's Threading Building Blocks (TBB) library to accomplish the same goal. In this talk we will discuss our work to compare TBB and OpenMP when used for scheduling algorithms to be run by a HEP style data processing framework (i.e. running hundreds of interdependent algorithms at most once for each event read from the detector). This includes both scheduling of different algorithms to be run concurrently as well as scheduling concurrent work within one algorithm. As part of the discussion we present an overview of the OpenMP threading model. We also explain how we used OpenMP when creating a simplified HEP-like processing framework. Using that simplified framework, and a similar one written using TBB, we will present performance comparisons between TBB and different compiler versions of OpenMP.

Consider for promotion

Yes

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Session Classification: Track 5 –Software Development

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