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The journey towards HEPscore, the HEP-specific CPU benchmark for WLCG

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HEPscore is a CPU benchmark, based on HEP applications, that the HEPiX Working Group is proposing as a replacement of the currently used HEPSpec06 benchmark, adopted in WLCG for procurement, computing resource pledges and performance studies.

In 2019, we presented at ACAT the motivations for building a benchmark for the HEP community based on HEP applications. The process from the conception to the implementation and validation of this objective has been inspiring and challenging. In the spirit of the HEP community, it has involved many contributions from software developers, data analysts, experts of the experiments, representatives of several WLCG computing centres, as well as the WLCG HEPscore Deployment Task Force.

In this contribution, we review this long journey and in particular the technological solutions selected, such as containerization of the HEP applications and cvmfs snapshotting. We update the community on the readiness status of HEPscore, the HEP application mix selected to build HEPscore and the deployment plans for 2023. We describe the current campaign of measurements performed on multiple WLCG sites, intended to study the performance of eleven HEP applications on more than 50 different computer systems.

Finally, we also cover how to extend the HEPscore adoption to the benchmarking of heterogeneous resources, and how it can include workloads for physics analysis and Machine Learning algorithms.

Significance

HEPscore is the candidate benchmark for compute performance. It bridges the experiments' HEP applications with the benchmark paradigms. As replacement of HS06, it will be of major interest for the whole HEP community

References

https://link.springer.com/article/10.1007/s41781-021-00074-y

Experiment context, if any

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