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Benchmarking WLCG resources using HEP experiment workflows

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The benchmarking and accounting of compute resources in WLCG needs to be revised in view of the adoption by the LHC experiments of heterogeneous computing resources based on x86 CPUs, GPUs, FPGAs. After evaluating several alternatives for the replacement of HS06, the HEPiX benchmarking WG has chosen to focus on the development of a HEP-specific suite based on actual software workloads of the LHC experiments, rather than on a standard industrial benchmark like the new SPEC CPU 2017 suite.

This presentation will describe the motivation and implementation of this new benchmark suite, which is based on container technologies to ensure portability and reproducibility. This approach is designed to provide a better correlation between the new benchmark and the actual production workloads of the experiments. It also offers the possibility to separately explore and describe the independent architectural features of different computing resource types, which is expected to be increasingly important with the growing heterogeneity of the HEP computing landscape. In particular, an overview of the initial developments to address the benchmarking of non-traditional computing resources such as HPCs and GPUs will also be provided.

On behalf of the HEPiX CPU Benchmarking Working Group [1,2]

[1] <https://w3.hepik.org/benchmarking.html>

[2] <https://twiki.cern.ch/twiki/bin/view/HEPIX/CpuBenchmark>

Primary author: Dr VALASSI, Andrea (CERN)

Presenter: Dr VALASSI, Andrea (CERN)

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