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A comparison of HEPSPEC benchmark performance on ATLAS Grid-Sites versus ideal conditions

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The goal of this study is to understand the observed differences in ATLAS software performance, when comparing results measured under ideal laboratory conditions with those from ATLAS computing resources on the Worldwide LHC Computing Grid (WLCG). The laboratory results are based on the full simulation of a single ttbar event and use dedicated, local hardware. In order to have a common and reproducible base to which to compare, thousands of identical ttbar full simulation benchmark jobs were submitted to hundreds of Grid sites using the HammerCloud infrastructure. The impact of the heterogeneous hardware of the Grid sites and the performance difference of different hardware generations is analysed in detail, and a direct, in depth comparison of jobs performed on identical CPU types is also done. The choice of the physics sample used in the benchmark is validated by comparing the performance on each Grid site measured with HammerCloud, weighted by its contribution to the total ATLAS full simulation production output.

Significance

HEPSPEC06 is still THE metric for the WLCG experiments. In this study we have analysed for the first time centrally via the HammerCloud testing and bench-marking infrastructure how the HEPSPEC06 value varies for a dedicated simulation job over different hardware generations on the entire computing grid. This study can be used as blue print for central evaluation for succeeding benchmark metricizes.

References

Experiment context, if any

ATLAS

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