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Exploring GlideinWMS and HTCondor scalability frontiers for an expanding CMS Global Pool

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The CMS Submission Infrastructure Global Pool, built on GlideinWMS and HTCondor, is a worldwide distributed dynamic pool responsible for the allocation of resources for all CMS computing workloads. Matching the continuously increasing demand for computing resources by CMS requires the anticipated assessment of its scalability limitations. Extrapolating historical usage trends, by LHC Run III the CMS Global Pool must be able to manage stably and efficiently 0.5M CPU cores, about a factor 2 from current size. In addition, the Global Pool must be able to expand in a more heterogeneous environment, in terms of resource provisioning (combining Grid, HPC and Cloud) and workload submission. A dedicated testbed has been set up to simulate such conditions with the purpose of finding potential bottlenecks in the software or its configuration. This contribution will provide a thorough description of the various scalability dimensions in size and complexity that are being explored for the future Global Pool, along with the analysis and solutions to the limitations proposed with the support of the GlideinWMS and HTCondor developer teams.

Primary authors: PEREZ-CALERO YZQUIERDO, Antonio (Centro de Investigaciones Energéti cas Medioambientales y Tecno); LETTS, James (Univ. of California San Diego (US)); MASON, David Alexander (Fermi National Accelerator Lab. (US)); DAVILA FOYO, Diego (Autonomous University of Puebla (MX)); BOCKELMAN, Brian Paul (University of Nebraska Lincoln (US)); KHAN, Farrukh Aftab (Fermi National Accelerator Lab. (US)); KOTOBI, Amjad (University of Malaya (MY)); LARSON, Krista (Fermi National Accelerator Lab. (US)); HURTADO ANAMPA, Kenyi Paolo (University of Notre Dame (US)); IVANOV, Todor Trendafilov (University of Sofia (BG)); MASCHERONI, Marco (Univ. of California San Diego (US))

Presenter: PEREZ-CALERO YZQUIERDO, Antonio (Centro de Investigaciones Energéti cas Medioambientales y Tecno)

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