Contribution ID: **41** Type: **not specified**

CMS

Thursday 12 December 2024 09:40 (15 minutes)

The rapid evolution of computing technologies, including AI and high-performance computing (HPC), has significantly impacted scientific advancements, particularly in high-energy physics (HEP). However, this progress comes at an environmental cost, as the energy and carbon footprints of computing tasks continue to grow. This presentation explores the energy consumption and carbon footprint of CMS simulation workflows, focusing on GENSIM jobs at the Large Hadron Collider (LHC).
We introduce a monitoring framework designed to measure energy usage and assess the environmental impact of HEP workloads. Preliminary results from the INFN-CNAF nodes demonstrate that optimizing resource allocation can significantly reduce energy consumption without compromising output. Metrics are normalized to provide actionable insights for sustainable computing practices.
Future developments aim to refine error estimation, build a structured database for footprint data collection, and establish automated analysis pipelines. These efforts align with the broader goal of mitigating the environmental impact of computational physics experiments.

Author: PICCINELLI, Andrea (University of Notre Dame (US))

Presenter: PICCINELLI, Andrea (University of Notre Dame (US))

Session Classification: Environmental Sustainability: The Experiments