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The Pierre Auger Observatory Grid Experience

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Overview

The astroparticle physics project Pierre Auger Observatory observes Ultra-high energy cosmic ray air showers using fluorescence and surface detectors installed on a large area in Argentina. The CPU demanding job of Monte Carlo simulations is done using grid resources.

Impact

More than 250 members of the Pierre Auger Collaboration can use libraries of air showers simulated with different models for several energy and theta angle values. About 40 members can process data files directly on the grid, the rest can access files at the CC IN2P3 in Lyon, where secondary copies of all successfully produced libraries are stored.

Description of the work

The production of air shower libraries is done in a organized way by a single central team. Tools developed by the team members cover several steps needed for succesful operations: preparation of input files for simulated showers according parameters given by the collaboration, bulk job submission, output registration in the Auger dashboard, check of results and job resubmission in case of failures. Tens of thousands jobs were executed in the grid infrastructure. We discuss main obstacles in job throughput increase and how we overcome them. Tools must be often adjusted to reflect changes in the middleware. We also present organization of simulated data preservation and how we export them to users without access to grid Storage Elements. Custom product SimDB is used as the database for SRB installed in CC IN2P3 Lyon.

Conclusions

We describe our practices for running Monte Carlo simulations jobs on the grid and distributed data management. Current achievements and issues are discussed.

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