

Cherenkov Telescope Array data processing: a production system prototype

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The Cherenkov Telescope Array (CTA) - a proposed array of many tens of Imaging Atmospheric Cherenkov Telescopes - will be the next-generation instrument in the field of very high energy gamma-ray astronomy. CTA will operate as an open observatory providing data products and analysis tools to the entire scientific community. An average data stream of about 1 GB/s for approximately 2000 hours of observation per year, is expected to produce several PB/year. A large amount of CPU time will be required for data processing as well as for massive Monte Carlo simulations used to derive the instrument response functions. The current CTA computing model is based on a distributed infrastructure for the archive and the data off-line processing. In order to manage the off-line data processing in a distributed environment, CTA has evaluated the DIRAC (Distributed Infrastructure with Remote Agent Control) system, which is a general framework for the management of tasks over distributed heterogeneous computing environments. For this purpose, a production system prototype has been developed, based on the two main DIRAC components, i.e. the Workload Management and Data Management Systems. This production system has been successfully used on three massive Monte Carlo simulation campaigns to characterize the telescope site candidates, different array layouts and the camera electronic configurations. Results of the DIRAC evaluation will be presented as well as the future development plans. In particular, these include further automatization of high level production tasks as well as the proposed implementation of interfaces between the DIRAC Workload Management System and the CTA Archive and Pipeline Systems, currently under development.

Primary author: ARRABITO, arrabito (LUPM CNRS/IN2P3)

Co-authors: HAUPT, Andreas (DESY, Linnaeus University); BREGEON, johan (LUPM - CNRS/IN2P3)

Presenter: ARRABITO, arrabito (LUPM CNRS/IN2P3)

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