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The Cherenkov Telescope Array production system prototype for large-scale data processing and simulations

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The Cherenkov Telescope Array (CTA) is the next-generation instrument in the very-high energy gamma ray astronomy domain. It will consist of tens of Cherenkov telescopes deployed in 2 arrays at La Palma (Spain) and Paranal (ESO, Chile) respectively. Currently under construction, CTA will start operations around 2023 for a duration of about 30 years. During operations CTA is expected to produce about 2 PB of raw data per year plus 5-20 PB of Monte Carlo data. The global data volume to be managed by the CTA archive, including all versions and copies, is of the order of 100 PB with a smooth growing profile. The associated processing needs are also very high, of the order of hundreds of millions of CPU HS06 hours per year. In order to optimize the instrument design and study its performances, during the preparatory phase (2010-2017) and the current construction phase, the CTA consortium has run massive Monte Carlo productions on the EGI grid infrastructure. In order to handle these productions and the future data processing, we have developed a production system based on the DIRAC framework. The current system is the result of several years of hardware infrastructure upgrades, software development and integration of different services like CVMFS and FTS. In this paper we present the current status of the CTA production system and its exploitation during the latest large-scale Monte Carlo campaigns.

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