



Contribution ID: 288

Type: poster

## Exercising CMS dataflows and workflows in computing challenges at the Spanish Tier-1 and Tier-2 sites

*Monday, September 3, 2007 8:00 AM (20 minutes)*

CMS undertakes periodic computing challenges of increasing scale and complexity to test its computing model and Grid computing systems. The computing challenges are aimed at establishing a working distributed computing system that implements the CMS computing model based on an underlying multi-flavour grid infrastructure. CMS dataflows and data processing workflows are exercised during a period of about a month targeting specific performance and scale goals. Performance values are measured, problems are identified and feedback into the design, integration and operation of the computing system is provided.

The CMS computing architecture is based on a tier-organised structure of computing resources, based on a Tier-0 centre at CERN, 7 Tier-1 centres for organized mass data processing, and about 30 Tier-2 centres where user physics analysis is performed. The Tier-0 is in charge of storing the data coming from the detector onto mass storage, performs a prompt reconstruction of the data and distributes the data among the Tier-1 centres. The Tier-1 sites archive on mass storage its share of data, run data reprocessing, organized group physics analysis for data selection and distribute down the selected data to Tier-2's for user analysis. Tier-1 centres also have the responsibility of storing Monte Carlo data produced at the Tier-2 sites. The above mentioned workflows have been exercised during October 2006 at a scale of 25% of what is needed for operations in 2008, and at a 50% scale during July 2007.

An overview of the data- and workflows conducted at the Spanish Tier-1 and Tier-2 sites during the CMS computing challenges since last CHEP conference is presented. The focus is on presenting achieved results, operational experience and lessons learnt during the challenges.

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**Session Classification:** Poster 1

**Track Classification:** Computer facilities, production grids and networking