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CMS results from Computing Challenges and Commissioning of the computing infrastructure

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During February and May 2008, CMS participated to the Combined Computing Readiness Challenge (CCRC'08) together with all other LHC experiments. The purpose of this world-wide exercise was to check the readiness of the computing infrastructure for LHC data taking. Another set of major CMS tests called Computing, Software and Analysis challenge (CSA'08) - as well as CMS cosmic runs - were also running at the same time: CCRC augmented the load on computing with additional tests to validate and stress-test all CMS computing workflows at full data taking scale, also trying to extend this to the global WLCG community. CMS exercised most aspects of the CMS computing model, with very comprehensive tests. During May, we moved more than 3.6 Petabytes among more than 300 links in the complex Grid topology. We demonstrated that we can safely move data out of CERN to the Tier-1s, sustaining the required rate of more than 600 MB/s as a daily average for more than seven days in a row, with enough headroom and with hourly peaks of up to 1.7 GB/s. We ran hundreds of simultaneous jobs at each Tier-1 site re-reconstructing and skimming hundreds of millions of events. After re-reconstruction the fresh AOD (Analysis Object Data) has to be synchronized between Tier-1 centers: we demonstrated that the required inter-Tier-1 transfers are achievable within a few days. We also showed that skimmed analysis data sets can be transferred to Tier-2s for analysis with sufficient rate, regionally as well as inter-regionally, achieving all our goals in over 90% of the ˜200 links. Simultaneously we also ran a large Tier-2 analysis exercise, where realistic analysis jobs were submitted to a large set of Tier-2 sites by a large number of people to produce a "chaotic"workload across the systems, and with more than 400 analysis users in May. Taken all together, CMS routinely achieved submission of ˜100k jobs/day, with peaks up to 200k jobs/day. All the achieved results are presented and discussed in the paper.

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