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Scaling CMS data transfer system for LHC start-up

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The CMS experiment will need to sustain uninterrupted high reliability, high throughput and very diverse data transfer activities as the LHC operations start. PhEDEx, the CMS data transfer system, will be responsible for the full range of the transfer needs of the experiment. Covering the entire spectrum is a demanding task: from the critical high-throughput transfers between CERN and the Tier-1 centres, to high-scale production transfers among the Tier-1 and Tier-2 centres, to managing the 24/7 transfers among all the 170 institutions in CMS and to providing straightforward access to handful of files to individual physicists.

In order to produce the system with confirmed capability to meet the objectives, the PhEDEx data transfer system has undergone rigorous development and numerous demanding scale tests. We have sustained production transfers exceeding 1 PB/month for several months and have demonstrated core system capacity several orders of magnitude above expected LHC levels.

We describe the level of scalability reached, and how we got there, with focus on the main insights into developing a robust, lock-free and scalable distributed database application, the validation stress test methods we have used, and the development and testing tools we found practically useful.

Submitted on behalf of Collaboration (ex, BaBar, ATLAS)

CMS

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