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Distributed Computing Grid Experiences in CMS DC04

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In March-April 2004 the CMS experiment undertook a Data Challenge(DC04). During the previous 8 months CMS undertook a large simulated event production. The goal of the challenge was to run CMS reconstruction for sustained period at 25Hz input rate, distribute the data to the CMS Tier-1 centers and analyze them at remote sites. Grid environments developed in Europe by the LHC Computing Grid (LCG) in Europe and in the US with Grid2003 were utilized to complete the aspects of the challenge.

During the simulation phase, US-CMS utilized Grid2003 to simulate and process approximately 17 million events. Simultaneous usage of CPU resources peaked at 1200 CPUs, controlled by a single FTE. Using Grid3 was a milestone for CMS computing in reaching a new magnitude in the number of autonomously cooperating computing sites for production. The use of Grid-based job execution resulted in reducing the overall support effort required to submit and monitor jobs by a factor of two.

During the challenge itself, the CMS groups from Italy and Spain used the LCG Grid Environment to satisfy challenge requirements . The LCG Replica Manager was used to transfer the data. The CERN RLS provided the needed replica catalogue functionality. The LCG submission system based on the Resource Broker was used to submit analysis jobs to the sites hosting the data. A CMS dedicated GridICE monitoring was activated to monitor both services and resources.

A description of the experiences, successes and lessons learned from both experiences with grid infrastructure is presented.

Primary authors: ANZAR, A. (FERMILAB); FANFANI, A. (INFN-BOLOGNA (ITALY)); HEAVEY, A. (FERMILAB); SCIABA', A. (EIS CERN); ZAHN, A. (UFL); MACEVOY, B. (IMPERIAL COLLEGE LONDON); MARTELLI, B. (INFN-CNAF); GRANDI, C. (INFN-Bologna); PRESCOTT, C. (UFL); BONACORSI, D. (INFN-CNAF); BRADLEY, D. (University of Wisconsin); COLLING, D. (Imperial College London); DONNO, F. (EIS CERN); FANZAGO, F. (INFN-Padova); DONVITO, G. (INFN-Bari); GRAHAM, G. (FERMILAB); MAGGI, G. (INFN-Bari); TALLINI, H. (Imperial College London); FISK, I. (FERMILAB); LEGRAND, I. (Caltech); HERNANDEZ, J. (CIEMAT Madrid); KAISER, J. (FERMILAB); LETTS, J. (UCSD); RODRIGUEZ, J. (UFL); WEIGAND, J. (FERMILAB); BOCKJOO, K. (UFL); WAKEFIELD, L. (Imperial College London); DELL'AGNELLO, L. (INFN-CNAF); GIACCHETTI, L. (FERMILAB); TUURA, L. (Northeastern University, Boston); BIASOTTO, M. (INFN-Legnaro); CORVO, M. (INFN-Padova); ERNST, M. (DESY); MAZZUCATO, M. (INFN-Padova); DE FILIPPIS, N. (INFN-Bari); KUROPATINE, N. (FERMILAB); RATNIKOVA, N. (FERMILAB); SINANIS, N. (CERN); CAPILUPPI, P. (INFN-Bologna); GARCIA-ABIA, P. (CIEMAT); PORDES, R. (FERMILAB); CAMPANA, S. (EIS CERN); FANTINEL, S. (INFN-Legnaro); SURESH, S. (Caltech); MARTIN, T. (UCSD); PERELMUTOV, T. (FERMILAB); JANK, W. (CERN); WU, Y. (FERMILAB)

Presenter: FANFANI, A. (INFN-BOLOGNA (ITALY))

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