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The Present and Future Challenges of Distributed Computing in the ATLAS experiment

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The ATLAS experiment has collected more than 5 fb-1 of data in 2011 at the energy of 7 TeV. Several billions of events had been promptly reconstructed and stored in the ATLAS remote data centers spanning tens of petabytes of disk and tape storage. In addition, a similar amount of data has been simulated on the Grid to study the detector performance and efficiencies. The data processing and distribution on the Grid sites with more than 100.000 computing cores is centrally controlled by the system developed by ATLAS, managing a coherent data processing and analysis of almost one million jobs daily. An increased collision energy of 8 TeV in 2012 and much larger expected data collection rate due to improved LHC operation impose new requirements on the system and suggests a further evolution of the computing model to be able the meet the new challenges in the future. The experience of large-scale data processing and analysis on the Grid is presented through the evolving model and organization of the ATLAS Distributed Computing system.

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