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DIRAC, the LHCb Data Production and Distributed Analysis system

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DIRAC is the LHCb Workload and Data Management system used for Monte Carlo production, data processing and distributed user analysis. It is designed to be light and easy to deploy which allows integrating in a single system different kinds of computing resources including stand-alone PC's, computing clusters or Grid systems. DIRAC uses the paradigm of the overlay network of "Pilot Agents", which makes it very resilient with respect to various sources of instabilities in the underlying computing resources.

DIRAC is used routinely in LHCb for MC data production and has powerful Production Manager tools to easily formulate and automatically steer tasks with complex workflows. The recent extensions for distributed analysis allow LHCb users to run their jobs on LCG reliably while benefiting from the DIRAC job monitoring and data management facilities.

In this paper we present an overview of the system, its main components and their interaction with LCG services and resources. The functionality with different types of workload is described. The experience of the DIRAC use in the recent Data and Service challenges will be highlighted together with the outlook for future development necessary to comply with the production service requirements.

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