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DIRAC: A community grid solution

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The DIRAC system was developed in order to provide a complete solution for using distributed computing resources of the LHCb experiment at CERN for data production and analysis. It allows a concurrent use of over 10K CPUs and 10M file replicas distributed over many tens of sites. The sites can be part of a computing grid such as WLCG or standalone computing clusters all integrated in a single management structure.

DIRAC is a generic system with the LHCb specific functionality incorporated through a number of plug-in modules. It can be easily adapted to the needs of other communities. A special attention is paid to the resilience of the DIRAC components to allow an efficient use of non-reliable resources. The DIRAC production management components provide a framework for building highly automated data production systems including data distribution and data driven workload scheduling.

In this paper we give an overview of the DIRAC system architecture and design choices. We show how different components are put together to compose an integrated data processing system including all the aspects of the LHCb experiment - from the MC production and raw data reconstruction to the final user analysis.

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