The DIRAC (Distributed Infrastructure with Remote Agent Control) project began as a solution for the LHCb experiment at CERN to carry out massive Monte Carlo simulation and data processing on various distributed computing resources. Now it is evolving to a complete Grid solution for community of users such as LHCb.

DIRAC forms a layer between a particular community of users and compute resources which:
- aggregates and masks the heterogeneity of computing and storage systems;
- provides consistent workload and data management tools;
- provides means to coordinate the activity of the community;
- improves the reliability of available resources by adding extra redundancy and failover mechanisms.

The DIRAC introduced the now widely used concept of Pilot Agents. This allows to build efficient Workload Management Systems (WMS) that are resilient to failures in the ever changing Grid environment. The main WMS characteristics are:
- Ability to work with various batch systems, grids and standalone PCs with different flavors of operating systems (Linux, Windows, ...);
- Job prioritization in the central Task Queue allows for an effective implementation of the community policies;
- Flexible workload optimization with Pilot Agents allows a single DIRAC WMS instance to manage both massive data production and user analysis activities.

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See S. Paterson et al. [174], G. Castellani et al. [340], Y. Y.Li et al. [296].

The DIRAC project includes a versatile Data Management System (DMS) which unites both native and third party components. The DMS features are:
- Automated data distribution along the entire data processing path from the LHCb detector to the final analysis;
- Reliable data transfers at all stages of the processing due to multiple failover and retry mechanisms;
- Multiple data consistency checks to ensure integrity and recover from data losses.

See A.C. Smith et al. [194], [195], M. Bargiotti et al. [168].

The DIRAC System is a complete Community Grid solution. It has all the necessary components to build Workload and Data management systems of varying complexity.

During the LHCb Data Challenge 2006:
- 1.5 million jobs were executed;
- Up to 10K jobs were running simultaneously;
- More than 120 sites were involved.

See R. Nandakumar et al. [150].

The LHCb DIRAC distributed user analysis platform has been stable for 2 years now.

The DIRAC project scales to the requirements of the LHCb experiment in exploiting Grid Computing Resources.

DIRAC offers a powerful Grid solution for other user communities.

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