Abstract, english version

This thesis presents a general-purpose software framework, which allows different multi-disciplinary communities to take advantage of a distributed computational infrastructure. The ultimate goal is to provide organizations that need to exploit resources with CPU-intensive loose-parallel tasks with a software service capable to offer a user-friendly, standard and highly customizable access to the Grid. The software suite has been designed specifically for organizations that cannot afford the adoption costs of more specialized and complex frameworks as the ones developed in High Energy Physics (HEP) environment, but that still require an easy-to-use interface to the Grid. The presented framework heavily relies on a bookkeeping database, storing both application-specific and infrastructure meta-data, which is tightly coupled with a web-based user interface. The first makes available to the users information about the execution status of jobs and their specific meaning and parameters, and contributes in orchestrating the submission mechanism. The latter provides job submission management, bookkeeping database interactions and monitoring functionality.

Multi-site submissions based on user-defined requests and fine grain parametric submission interfaces are available. The structure of framework services follow a centralized design: job management service and bookkeeping database are hosted in a European Grid Infrastructure (EGI) site. Jobs executed into remote sites transfer their output to the Storage Element of a predefined target site and update the bookkeeping database. In addition, the framework requires a proper configuration of the remote Grid sites on which the jobs will run in terms of input files and application availability. Results from a large production of Monte Carlo simulated events submitted to 15 Grid sites have been reported.

Dirac suite is a software framework for distributed computing providing a complete solution to one (or more) user community requiring access to distributed resources (Grid and Cloud). The last phase of the work has been dedicated to the merging of specific framework functionality with the Dirac
system. The goal of this phase is to obtain a Dirac flavor able to tightly integrate the specific VO operations management. In fact the typical VO computing model including Dirac at present time foresees also a disconnected bookkeeping DB and a logic layer acting as a bridge between the two environments. The stand alone Dirac workload management (Dirac) and the VO operations in terms of application and metadata management can interact directly inside Dirac to guarantee the highest level of synergy that subsequently brings the integrated system to an increased level of usability and robustness. A new Dirac module and the related Dirac web portal section have been developed to integrate the bookkeeping DB and the job wrapper elements of the presented framework. The new Dirac flavor functionality have been tested obtaining successful results.