Bachelor Thesis / Bachelorarbeit

A RESTful Framework for Statistical Analysis

Beginning: immediately

Background
Cloud computing [8] is a recent paradigm that enables IT Operations to permanently or occasionally run workloads on a highly scalable and pay-per-use infrastructure. Applications in the eScience domain often require the usage of mathematical and statistical tools which are often proprietary and demand a considerably amount of computational resources for building mathematical and statistical models. Running such libraries in a Cloud infrastructure can significantly and simultaneously decrease the computation time while decreasing the monetary costs of running such analyses. In this Bachelor thesis we focus on the open-source mathematical and experimental ecosystem SciPy [3]. More specifically, we aim to provide a subset of its functionalities by building a RESTful application using existing frameworks and tools, e.g. Django [1, 2].

Tasks
- Analysis for enabling the deployment and execution of the SciPy “stats” functionalities and accessing them using RESTful services [6], taking into consideration:
  - Diverse data transfer formats: XML, JSON, etc.
  - Its usage by multiple users.
- Requirement analysis, specification, and design for a Cloud based statistical analysis tool:
  - Based on the SciPy libraries for the core analytical tool.
  - Accessible through a Web service interface
  - Taking into account multi-tenancy
- Prototypical implementation
- Evaluation of the implemented approach
Required previous knowledge and experiences

- Python programming skills and expertise
- Cloud Computing [8]
- Web Services, WSDL, etc. [4], [5], [7].
- ...or the declared intention to deeply dive into these topics in advance

The lectures of Services Computing, and the literature attached, such as [1-7] are recommended for preparation. The student has to manage his schedule including this work packages and milestones for himself. A helpful guide for planning and writing a thesis can be found in [9] and [10]. The preferred language of the work is English.

Literature


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