Chapter 1 - Introduction

The aim of this paper is to describe all the work that has been done during the development of this project, that is valid for the Laboratory of Advanced Programming exam and the project part of the Dependable Distributed System course.

In chapter 2, we provide all the system requirements, starting from the high level specification, that gave life to our system. The peculiarity of these requirements is that they are user-centered requirements, and in fact they are expressed in the form of user stories. Additionally, we provide a brief overview about the effort estimation we have conducted by means of the COCOMO II analysis, starting from the calculation of the function points of the software we have developed.

In chapter 3, we provide a detailed description of the system architecture: in particular, we describe in detail all the nodes of the system, their interactions and all the architectural choices in terms of number of replicas and load balancing.

In chapter 4, we provide a detailed description of the system deployment: in particular, we describe in detail the way in which we can install and run the application, once we have pulled it from the corresponding GitHub repository. There is also a brief description of how to undeploy the application once it has been installed, just in case one wants to uninstall it.

Chapter 2 - System Requirements

In this chapter, we provide all the system requirements, starting from the high level specification, that gave life to our system. Then, we describe all the user stories which constitute the user-centered requirements of our system, and finally we present the results of the COCOMO II analysis that we have conducted, starting from the calculation of the function points, in order to estimate the effort required for developing the entire application.

2.1 - High-Level Specification

2.1.1 - Introduction and Objectives of the Project

The aim of this section is to provide an overview on the overall application that is going to be developed. The purpose of this application is to offer a new task management system that is not a simple agenda, in which every user can manage his/her tasks or events (which are team shared tasks), and also the tasks or events that are organized by one or more small teams.
Every user is defined by his/her personal data, such as name, surname, date of birth, email address, username and password; the username must be unique. A user can be part of one or more teams; a user can also create and manage one or more teams (in other words, a user can be a team administrator), and add other people to be part of the newly created team. Depending on whether a user is part of a team or not, he/she can create an event or a task and put it into his/her agenda; however, there are some constraints that have to be taken into account: for instance, the fact that an event should be created only if the corresponding time slot of all the team members involved in the event is empty, and so on. The event can involve a subgroup of the team members or all of them.
Every team is defined by a unique identifier, a name, the username of the administrator and the usernames of the people that are part of the team itself; every team must be composed of at least one person, and of at most ten people.
Every task is defined by a unique identifier, a description and a specific date and time. A task can be personal for a specific user, or can be shared within a specific team; a shared task (event), is a task that belongs to a specific team, instead of a single user. An event is also characterized by the list of the team members that will attend the event itself.