Abstract: This work describes a system that enables sharing of cloud resources through a middle-ware layer we call market. It is designed with the requirements: minimal configuration, easy access and sharing in mind. This effort resulted in a platform that provides a common interface to cloud computing resources, hiding implementation details from the users and allowing them to tap into cloud resources from different vendors. The system supports extensible mechanisms to configure virtual machines dispensing the user from error-prone tasks, such as setting up and configuring compute clusters. A simple web based user interface is provided which allows browsing, configuring, launching and managing of virtual machines and virtual clusters. Integrated remote desktop facilities make the virtual computing resources accessible directly from the user interface.

1 Introduction

In the last decade, models for computing infrastructure are under drastic change. In many application areas the use of cloud computing [RCL09] is gaining ground. The easy provisioning and deallocation of computing resources combined with the fact that one gains better utilization of the underlying hardware, have lead to a situation where many organizations consider switching to cloud computing or are already in the progress of doing so.

Cloud computing as a discipline of computer science is considered mature for practical applications. These applications can usually be assigned to one of the three service levels given in the NIST definition of cloud computing [MG11]. The first level according to this definition is Infrastructure as a Service (IaaS) where a cloud provides virtual computing instances that can be provisioned via software interfaces. On top of that often Platform as a Service (PaaS) systems run that provide more complex computing platforms to their users. These platforms are able to use the underlying IaaS cloud in order to scale dynamically to current compute demands. Finally, on top of the PaaS systems, or even directly on IaaS virtual instances, Software as a Service (SaaS) applications are living. They provide a very