A Marketplace Framework for Trading Cloud-Based Services

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Abstract. The importance of marketplace frameworks, where demand and supply for electronic services meet, has gained momentum with the recent technological innovations of cloud computing. In particular the emerging market for cloud and XaaS offerings is, in the current early stage of development, scattered and represented by many single offerings. New intermediaries are required for the consolidation of the available service offerings and for providing a one-stop-shopping opportunity for customers. This paper proposes a new cloud marketplace solution that enables on the one hand an integrated platform for the development and selling of XaaS products and on the other hand a one-stop-shopping for customers interested in services. Service providers can merchandise and sell their products through the marketplace supporting the whole lifecycle of these products. Service consumers are provided with a unique personalized service search and resolution engine, helping them to find and customize the products they need.

Keywords: Electronic marketplace, cloud computing, trading services, business resolution, analytics.

1 Introduction

Clouds can be considered nowadays as a common solution for trading and provisioning any type of ICT assets as products, which in the cloud terminology is denoted as XaaS (Everything as a Service) [2, 19]. The term refers to an increased number of cloud-based resources and services provided over the Internet, with the most common examples, following the SPI model [18], Software (SaaS), Platform (PaaS) and Infrastructure (IaaS) as a service. Other examples of XaaS may be storage, communications, network and monitoring as a service. Besides the technical
advancements in the area of cloud computing, there are still several limitations [3], especially from the business perspective that clouds need to overcome in order to allow the wide adoption of clouds as true business ecosystems. In this paper, we propose a marketplace for cloud-based services that provides simplified, effective and agile processes to all stakeholders involved in the value chain of a product, for consuming or providing services and resources. The purpose of this marketplace is not only to offer a single, well-known meeting point for the different stakeholders but also to support the various technical and business requirements in all phases of the service lifecycle (planning, analysis and design, development and testing, provisioning, deployment, discovery, composition, execution, and monitoring, - see [14]). The marketplace, as part of an integrated cloud platform [1], will allow XaaS providers to publish their products in a managed environment, which controls the business terms and conditions (price, revenue sharing, promotion, etc.), including advanced pricing and billing capabilities [12].

In that sense, a cloud marketplace should address several challenges in order to provide efficient communication between the various stakeholders involved. In the service discovery phase, marketplaces should be capable to interpret the high level business and technical requirements from customers and select products or recommend product compositions. While various approaches exist on performance prediction and according to that, proceed with the aforementioned discovery phase (e.g. [8]), marketplace operations mainly depend on cost effective pricing models and Service Level Agreements (SLAs) which capture the technical and business requirements of customers and providers [6]. Based on the selected pricing models and SLAs, the required services and resources are identified, resolved (analysis of the dependencies) and deployed while respective monitoring and management policies are negotiated with the underlying cloud layers.

The proposed framework aims at providing advanced functionality for trading of services in the cloud that fosters the development of a dynamic and fair ecosystem for services and service-based applications. To this direction, a provider that will use the marketplace will be able to define new product offerings, including all business information (price, application level SLAs, etc.), while the customer will be able to search for services, customize and contract them.

Even though the marketplace is currently an integral part of the overall cloud platform developed in the 4CaaSt project [1], we envision that it could be integrated to any cloud environment since it follows a service oriented architectural design and state of the art technologies and standards. The marketplace represents the customer interface of the platform and therefore will simplify the interactions between the customer and the cloud and cover many aspects of the overall lifecycle. In addition, its functionality will be enhanced with processes for collecting valuable information for rating, billing and settling the incomes as well as statistics analytics in favour of providers and the marketplace itself. By analysing past interactions between providers and consumers, the marketplace will be able to offer best practices as an added value.