

MultiCloud 2013 Chairs' Welcome

Cloud Computing has developed from a playground for end-users and service providers to a relevant economic provisioning environment. In particular small to medium enterprises and new entries into the IT market jump onto the capabilities offered by cloud computing for comparatively low cost.

European industry consists of roughly 20 Million small to medium enterprises and has a strong orientation to the service industry, with 4 Million enterprises already in 2006. Out of these 4 Million, 12% are focusing on IT services¹. This comprises a high potential market of cloud uptakers – both for service provisioning and consumption. Historically, Europe has a strong tradition in focusing on business-2-business service provisioning, making it seemingly invisible in the global (end-user driven) service market, but even more important for its impact on the general economy. Hence, the requirements set forward by the European IT ecosystem will have a major impact on the definition and usage of clouds in the future.

Though the degree of dynamicity is obviously lower with a focus on business-to-business services, their individual requirements in terms of number of resources is considerably larger, leading to higher load. As opposed to the US, however, Europe has only comparatively small infrastructure providers, with probable exception in the Telecommunication sector. The European IT infrastructure is therefore predominantly dispersed and strongly heterogeneous, with multiple medium sized providers exposing various types of resources to the user.

Whilst this offers more variety and richness, which is particularly beneficial for dedicated use cases, it, at the same time, poses a risk of running out of resources for the major service provisioning cases. In critical environments, the general approach so far was to rely completely on in-house resources, thus ensuring availability and configuration according to the specific usage requests. This, however, quickly leads to too high costs and / or low quality, so that out-hosting quickly gains in relevance in Europe.

European clouds, however, are not sufficient to provide the necessary scope for these kinds of applications and relying on American providers only addresses parts of the problem. Availability and reliability requirements in Europe are furthermore way higher than in the typical, end-user driven US scenario, due to the strong business incentive. In fact, current outages of data centres can last several hours, which may be only annoying for a private end-user, but may have disastrous impact in a large-scale business scenario. True availability of these resources ranks more around 95% than the frequently claimed 99.99%² - no wonder that in particular larger enterprises still express a strong distrust against clouds.

In order to overcome this resource shortage and further increase availability in the scope needed for European business scenarios, mechanisms to incorporate multiple cloud environments into one single resource infrastructure are needed. Such federated or multi-clouds offer the capabilities of multiple resource environments in one single infrastructure. This not only increases the resource scope, but also enables combination of dedicated platforms and according exploitation of their specialized capabilities.

¹ http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-ET-11-001/EN/KS-ET-11-001-EN.PDF

² Bitcurrent, “Cloud performance from the end user,” <http://www.bitcurrent.com/>, Tech. Rep., 2011.

However, this also generates massive problems not only to deal with the interoperability and portability, but also technical and legal issues, ranging from software engineering principles over resource management to governance and liability. The necessary expertise for this movement is mostly non-existent as yet and needs to be carefully built up first. Europe is at an optimal position to address these challenges given its heterogeneous pre-disposition in IT, as well as in politics – no other country has to take such an integrative stance from ground up.

The Multi-Cloud workshop was initiated with this specific background in mind, to bring together experts from various fields in the cloud service lifecycle to discuss and exchange research results that help building up necessary the technical foundation and expertise. The workshop attracted contributions from all over the world, only the best of which were invited to participate. The proceedings comprise these contributions in the following order:

Section 1 elaborates the problems and necessities behind the federated or multi-clouds in more detail, looking in particular at the technical and economic challenges arising from current requirements.

Section 2 provides insight into novel approaches to developing federated and multi-cloud applications and converting the non-functional properties into concrete execution models.

Section 3 deals with supporting the execution of cloud applications in multi-cloud environments. This includes aspects of moving services across clouds, scheduling and load balancing, etc.

We thank all authors for their contributions, and specifically all organizers to make this event happen. Enjoy reading.

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