

CCPI 2011: Workshop on Cloud Computing Projects and Initiatives

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Foreword

Cloud computing is a recent computing paradigm for enabling convenient, on-demand network access to a shared pool of configurable computing resources (e.g. networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction. Clouds are currently used mainly in commercial settings and focus on on-demand provision of IT infrastructure. Cloud computing can play a significant role in a variety of areas including innovations, virtual worlds, ebusiness, social networks, or search engines. But currently, it is still in its early stages, with consistent experimentation to come.

The *Workshop on Cloud Computing Projects and Initiatives* (CCPI), organized by the European FP7-ICT Project mOSAIC (<http://www.mosaic-cloud.eu>) - within the objectives of DG-INFSO - Internet of Services, Software and Virtualization Unit¹, gathered together scientists, engineers, computer users both from industry and academia to exchange and share experiences, new ideas, and research results from collaborative international and national projects and initiatives on Cloud Computing. A number of key projects funded by the European Commission and by National Government and Research Agencies, addressing several aspects of the Cloud Computing arena, were presented at the workshop, and now in the following post-workshop proceeding papers.

The paper *Towards Cross-Platform Cloud Computing*, by Magdalena Slawinska, Jaroslaw Slawinski, Vaidy Sunderam attempts to analyze the commonalities and differences between cloud offerings with a view to determining the extent to which they may be unified. They propose the concept of dynamic adapters supported by runtime systems for environment preconditioning, that help facilitate cross platform deployment of cloud applications. In this vision paper, they outline the issues involved, and present preliminary ideas for enhancing the executability of legacy applications on various cloud platforms.

The paper *QoS Monitoring in a Cloud Services Environment: the SRT-15 Approach* by Giuseppe Cicotti, Luigi Coppolino, Rosario Cristaldi, Salvatore D'Antonio and Luigi Romano presents a innovative Quality of Service monitoring facility, named QoSMONaaS, built on top of the SRT-15, a Cloud-oriented platform being developed in the context of the homonymous FP7 EU project.

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In particular the authors present the main components of QoSMONaaS and its internal operation with respect to a case study of an Internet of Thing (IoT) application.

The paper *Enabling e-Science applications on the Cloud with COMPSs* from Daniele Lezzi, Roger Rafanell, Abel Carrion, Ignacio Blanquer Espert, Vicente Hernandez and Rosa M. Badia presents the implementation of scientific workflows through the COMPSs framework and their deployment and execution on the VENUS-C platform.

The paper *OPTIMIS and VISION Cloud: How to manage data in Clouds*, by Spyridon V. Gogouvitis, George Kousiouris, George Vafiadis, Hillel Kolodner and Dimosthenis Kyriazis presents two EU funded FP7 projects, namely OPTIMIS and VISION Cloud, that deal with data management in Cloud environments. The paper portrays the key value-add characteristics of their designs that improve the state of the art towards providing more advanced features for Cloud-based storage services. The similarities and differences between the approaches taken by the two projects in issues such as ease of management, data mobility and federation, coupling storage with computing power and guaranteeing QoS are presented and discussed.

The paper *Integrated Monitoring of Infrastructures and Applications in Cloud Environments* by Roberto Palmieri, Pierangelo di Sanzo, Francesco Quaglia, Paolo Romano, Sebastiano Peluso, and Diego Didona, illustrates some of the achievements of the Cloud-TM FP7 project. In particular, it presents the approach that has been taken while designing and implementing a monitoring subsystem, which represents a building block for the realization of a self-adapting, Cloud based middleware platform providing transactional data access to generic customer applications.

The paper *Towards Collaborative Data Management in the VPH-Share Project* by Siegfried Benkner, Jesus Bisbal, Gerhard Engelbrecht, Rod D. Hose, Yuriy Kaniovskiy, Martin Koehler, Carlos Pedrinaci, and Steven Wood outlines the vision of the European project VPH-Share in providing an organisational fabric (called infostructure) for the health care domain. The infostructure will be realised as a set of services on top of Cloud technologies for exposing and managing data, information and tools, and for enabling the composition of advanced workflows within the scope of the Virtual Physiological Human Initiative

The paper *SLM and SDM challenges in federated infrastructures* was produced by members of the EC funded gSLM project. It draws on experiences in service level management in e-Infrastructures such as Grids to set out the challenges in managing multi-cloud services. These include the weakness of service level agreements offered by commercial cloud providers, the complex relationship structures seen in multi-clouds, the difficulty in assigning responsibility in federated environments and the limited options for enforcement and penalisation these factors entail.

The paper *Rapid Prototyping of Architectures on the Cloud Using Semantic Resource Description* by Houssam Haitof attempts to present a framework for rapid instantiations of service representations of resources from their semantic

description. The idea is to allow the rapid prototyping of resources and resource relationships to be used in Cloud infrastructure environments. A semantic model is presented as well as the managed resource framework used to generate service representations with a management interface.

The paper *Cloud Patterns for mOSAIC-enabled Scientific Applications* from T.F. Fortis ,G.E. Lopez, I.P. Cruz, G. Ferschl and T. Mahr illustrates the current achievements of the mOSAIC project related identification and description of a set of reusable cloud patterns and cloud use cases for scientific applications, extending existing results in order to address the specific requirements, as identified via the mOSAIC project.

The paper *Enhancing an autonomic cloud architecture with mobile agents* from Umberto Villano, Massimiliano Rak, Antonio Cuomo, Salvatore Venticinque presents an interesting application of mobile agents technology to support resource monitoring in clouds, grids and hybrid architectures. The proposal is integrated into a larger framework which supports autonomic management of distributed applications. A case study is shown in the context of Cloud@Home, a cloud environment built on top of volunteered resources, currently under development as a project funded by the Italian research initiative PRIN 2008.

The paper *Mapping Application Requirements to Cloud Resources*, from Yih Leong Sun, Terence Harmer, Alan Stewart, and Peter Wright, proposes a constraints - based model for discovering Cloud resources in a multi-provider environment. This paper studies a financial use case scenario and suggests the use of a provider-agnostic approach which hides the complex implementation details of selecting Cloud resources.