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5th International Workshop on Principles of Engineering Service-Oriented Systems (PESOS 2013)

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Abstract—PESOS 2013 is a forum that brings together software engineering researchers from academia and industry, as well as practitioners working in the areas of service-oriented systems to discuss research challenges, recent developments, novel application scenarios, as well as methods, techniques, experiences, and tools to support engineering, evolution and adaptation of service-oriented systems. The special theme of the 5th edition of PESOS is “Service Engineering for the Cloud” The goal is to explore approaches to better engineer service-oriented systems, to either take advantage of the qualities offered by cloud infrastructures or to account for lack of full control over important quality attributes. PESOS 2013 also continues to be the key forum for collecting case studies and artifacts for educators and researchers in this area.

Index Terms— Software engineering, services, SOA, service-oriented architecture, service-oriented systems, cloud computing, cloud services

I. INTRODUCTION

Service-Oriented Architecture (SOA) and service-oriented systems, which are built using the SOA paradigm, are now in the stage of widespread adoption, at least according to Gartner’s Hype Cycle of Emerging Technologies. Due to the fact that some of the standards for service integration have stabilized, and driven by IT cost savings, organizations are starting to incorporate external software services into their systems, some of which are hosted in the cloud. From a provider perspective, many commercial companies such as Oracle, SAP, Intuit, and Netflix either have cloud-based offerings of their products or run their businesses completely in the cloud.

As promising as this movement sounds for an IT organization, the main challenge is service design. Even though cloud platforms and infrastructures are designed for elasticity and scalability, this does not mean that services running on them automatically inherit these attributes. This requires service-oriented systems to be robustly engineered and architected to either take advantage of the qualities offered by cloud infrastructures or to account for lack of full control over important quality attributes. Desired run-time behavior (e.g., management, adaptation, QoS, scalability, etc.) must not be an

afterthought, but must be supported by appropriate design-time software engineering methods and tools. Aspects such as run-time monitoring and adaptation will need to become main features in these systems. For both cloud providers and consumers, establishing, managing and enforcing service-level agreements increasingly become important activities. The impact that these issues have on software engineering and how the software engineering research community can help address these and other relevant issues are the focus of this edition of the PESOS workshop, thus providing new insights on the key challenges faced in service engineering for the cloud

II. WORKSHOP THEME AND GOALS

PESOS 2013 provides a forum for presenting and discussing a wide range of topics related to software engineering for service-oriented systems and service engineering in the cloud. The goal of PESOS is to bring together researchers from academia and industry, as well as practitioners working in the areas of software engineering and service-oriented systems to discuss research challenges, recent developments, novel applications and scenarios, as well as methods, techniques, experiences, and tools to support the engineering and use of service-oriented systems in the cloud.

The special theme of the 5th edition of the PESOS workshop is “Service Engineering for the Cloud.” Cloud Computing is shaping the way that organizations acquire and use systems — software-as-a-service (SaaS) model — and how they develop and deploy systems — platform-as-a-service (PaaS) and infrastructure-as-a-service (IaaS) models. Even though cloud platforms and infrastructures are typically designed to scale on demand, the question is whether this automatic elasticity translates to all services deployed on them. Other qualities of concern and interest in this environment include monitorability, manageability, privacy, availability and reliability. Service-oriented systems in the cloud will have to be better engineered, to either take advantage of the qualities offered by cloud platforms and infrastructures, or to account for lack of full control over important quality attributes. Therefore, there are a number of open software engineering research

challenges related to design, development, deployment, use, and integration of cloud services.

PESOS 2013 addresses topics related to software engineering for services in the cloud, such as:

- Service engineering for elasticity, scalability, monitorability, and other attributes expected of cloud services
- Methods and tools for design-time software engineering support for desired run-time behavior
- Management of service-oriented systems in the cloud
- Adaptation and evolution of service-oriented systems
- Service personalization and context-aware provisioning
- Service dependability, survivability, reliability and resilience
- Trust, security, and privacy in service-oriented systems
- Quality of service (QoS) and Service-level Agreements (SLAs)
- Verification and validation of service-oriented systems
- System migration to service-oriented systems in the cloud
- Service delivery models for mobile users
- Service-oriented systems supporting cloud-based provisioning

In addition, PESOS 2013 continues “The Quest for Case Studies.” Started at PESOS 2012 as a special session, it is now making an essential part of the workshop as the forum for researchers and practitioners sharing this vision and willing to contribute with their effort and experience. The goal is to create the reference set of case studies for the research community in service-oriented systems, hosted on a publicly available repository: <http://www.s-cube-network.eu/use-cases>.

III. SUBMISSION AND REVIEW PROCESS

A very thorough review process was followed to ensure high quality papers and presentations. Every research paper was reviewed by at least three program committee members. Out of the 19 submissions, only the five best papers were accepted as full papers for publication and presentation at the workshop. Two additional excellent submissions that represented early work and promising ideas were accepted as

short papers in order to create discussion and trigger creative solutions for the engineering of service-oriented systems.

IV. WORKSHOP ACTIVITIES

The workshop started with a keynote titled “SOA in the Google Cloud” by Marija Mikić-Rakić, a Staff-Level Software Engineering Manager at Google. The paper presentations were short so there was plenty of time for open discussions. The goal of the workshop is to continue identifying the set of guiding principles for engineering service-oriented systems, and to continue evolving this list at future instances of PESOS. A summary of the workshop will be published in the ACM Software Engineering Notes. Up-to-date information on the workshop, keynote, accepted papers, and program can be found at <http://www.sei.cmu.edu/community/pesos2013/>.

V. WORKSHOP ORGANIZERS

Domenico Bianculli is a research associate at the Software Verification and Validation laboratory of the Interdisciplinary Centre for Security, Reliability and Trust (SnT), at the University of Luxembourg, Luxembourg. His primary research area is software engineering, with particular emphasis on the specification, verification and validation of service-oriented systems.

Patricia Lago is Associate Professor at VU University Amsterdam, leading the group on software service engineering in the Department of Computer Science. Her research interests are software and service architectures, architectural knowledge management and Green IT.

Grace Lewis is a Senior Member of the Technical Staff in the Advanced Mobile Systems Initiative at the Carnegie Mellon Software Engineering Institute. Her research interests are mobile computing, cloud computing and service-oriented architecture.

Hye-Young Paik is a Senior Lecturer in the School of Computer Science and Engineering, University of New South Wales, Sydney, Australia. Her main research area is in service oriented computing principles and architecture, with particular interests in flexibility and adaptability of SOA systems applied to Business Process Management (BPM).