Communications
in Computer and Information Science

Commenced Publication in 2007
Founding and Former Series Editors:
Alfredo Cuzzocrea, Xiaoyong Du, Orhun Kara, Ting Liu, Dominik Ślęzak, and Xiaokang Yang

Editorial Board

Simone Diniz Junqueira Barbosa
  Pontifical Catholic University of Rio de Janeiro (PUC-Rio),
  Rio de Janeiro, Brazil

Phoebe Chen
  La Trobe University, Melbourne, Australia

Joaquim Filipe
  Polytechnic Institute of Setúbal, Setúbal, Portugal

Igor Kotenko
  St. Petersburg Institute for Informatics and Automation of the Russian Academy of Sciences, St. Petersburg, Russia

Krishna M. Sivalingam
  Indian Institute of Technology Madras, Chennai, India

Takashi Washio
  Osaka University, Osaka, Japan

Junsong Yuan
  Nanyang Technological University, Singapore, Singapore

Lizhu Zhou
  Tsinghua University, Beijing, China
More information about this series at http://www.springer.com/series/7899
Advances in Service-Oriented and Cloud Computing

Workshops of ESOCC 2017
Oslo, Norway, September 27–29, 2017
Revised Selected Papers
Preface

This volume contains the joint workshop proceedings of the events co-located with the 6th European Conference on Service-Oriented and Cloud Computing (ESOCC), held in Oslo, Norway, September 27–29, 2017. ESOCC 2017 was organized by the University of Oslo, Norway.

On the first day of the conference, the following workshops were held:

- The First International Workshop on Business Process Management in the Cloud (BPM@Cloud)
- The Third International Workshop on Cloud Adoption and Migration (CloudWays)
- The EU Projects Track

Each workshop submission was reviewed by at least three Program Committee members, and the authors contributed revised articles to this volume of proceedings, taking additional feedback during the workshop into account. Here, a brief description of each workshop is given.

The BPM@Cloud 2017 workshop focused on business process management in the cloud. Organizations are continuously thinking of moving to the cloud in order to reduce costs as well as allow a more flexible provisioning of their business processes (BPs) and services. As they do not possess the appropriate expertise, there is a need to support them via platforms able to realize the respective methods, techniques, and algorithms that concentrate on checking which parts of their BPs should be moved to the cloud, bridging the gap between the business and IT level, and supplying assistance to the four main life cycle activities of BP design, allocation, execution, and evaluation in the cloud. In this respect, the notion of BP as a service (BPaaS), i.e., a Web-based business process that runs in the cloud, arises, which is projected to become quite profitable for the organizations participating in its value chain. As such, BPaaS not only caters for migrating existing BPs in the cloud but can also become a novel exploitation product in the cloud stack that will further boost the adoption of cloud computing. The BPM@Cloud 2017 workshop brought together experts on business process management (BPM) and cloud computing from both academia and industry. It became a medium for thorough discussion and collaboration between its participants. It enabled its presenters to disseminate work that better promotes the notion of BPaaS while also fostering the multidisciplinary collaboration between different research areas in cloud computing and BPM to realize this notion. New challenges were also identified, which can direct the research to be conducted over BPM in the cloud in the near future. The first part of this volume includes all the technical papers of BPM@Cloud 2017.

The CloudWays 2017 workshop focused on cloud adoption and migration. Regardless of the benefits of cloud computing, many organizations still rely on business-critical applications in the form of legacy systems that have been developed over a long period of time using traditional development methods. Despite often serious maintainability issues, (on-premise) legacy systems are still crucial as they support core
business processes. Therefore, migrating legacy systems toward cloud-based platforms allows organizations to leverage their existing systems deployed and provided (using publicly available resources) as scalable cloud services. The CloudWays 2017 workshop brought together cloud migration experts from both academia and industry: to promote discussions and collaboration among participants; to help disseminate novel cloud adoption, migration, and software architecture practices and solutions; and to identify future cloud architecture challenges and dimensions. The second part of this volume includes all the technical papers of CloudWays 2017.

The EU Projects Track 2017 aimed at presenting the major running European-funded projects highlighting the main industrial and academic trends in terms of research and innovation in service-oriented and cloud computing-related domains. The third part of this volume includes all papers of the EU Projects Track 2017.

The contributions of the main conference are published as the 6th IFIP WG 2.14 European Conference ESOCC 2017 proceedings in LNCS vol. 10465 by Springer, 2017.

As workshop organization chairs, we would like to thank the individual workshop chairs for their efforts in publicizing the events and succeeding in bringing together participants and authors with contributions reflecting the state of the art. We would also like to thank all authors who presented their work at the events and are contributing here in this volume.

We are also grateful to the local organization team in Oslo that took care of most logistical aspects of organizing such an event, and to the general chair of ESOCC, Einar Broch Johnsen, for giving us the opportunity to hold these events together with the conference.

January 2018

Zoltán Ádám Mann
Volker Stolz
Contents

**BPM@Cloud**

Towards PaaS Offering of BPMN 2.0 Engines: A Proposal for Service-Level Tenant Isolation .......................... 5  
_Majid Makki, Dimitri Van Landuyt, and Wouter Joosen_

CEP-Based SLO Evaluation ............................... 20  
_Kyriakos Kritikos, Chrysostomos Zeginis, Andreas Paravoliasis, and Dimitris Plexousakis_

Towards Business-to-IT Alignment in the Cloud ......................... 35  
_Kyriakos Kritikos, Emanuele Laurenzi, and Knut Hinkelmann_

**CloudWays**

Engineering Cloud-Based Applications: Towards an Application Lifecycle ........................................ 57  
_Vasilios Andrikopoulos_

A Cloud Computing Workflow for Managing Oceanographic Data ........ 73  
_Salma Allam, Antonino Galletta, Lorenzo Carnevale, Moulay Ali Bekri, Rachid El Ouahbi, and Massimo Villari_

An Ontology-Based Architecture for an Adaptable Cloud Storage Broker .... 86  
_Divyaa Manimaran Elango, Frank Fowley, and Claus Pahl_

Cloud-Native Databases: An Application Perspective ....................... 102  
_Josef Spillner, Giovanni Toffetti, and Manuel Ramírez López_

Testing and Comparing the Performance of Cloud Service Providers Using a Service Broker Architecture ......................... 117  
_Divyaa Manimaran Elango, Frank Fowley, and Claus Pahl_

TOSKER: Orchestrating Applications with TOSCA and Docker .............. 130  
_Antonio Brogi, Luca Rinaldi, and Jacopo Soldani_

**EU Projects**

Secure Data Processing in the Cloud .................................. 149  
_Zoltán Ádám Mann, Eliot Salant, Mike Surridge, Dhouha Ayed, John Boyle, Maritta Heisel, Andreas Metzger, and Paul Mundt_