Editorial

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Biographical notes: Ismael Bouassida Rodriguez received his Engineering and MS in Computer Science from the National School of Computer Sciences of Manouba and PhD from the University of Toulouse and University of Sfax in 2011. He joined the National School of Engineers in Sfax as Assistant Professor of Computer Science in 2010. He joined the Higher Institute of Computer Science and Multimedia of Sfax as an Associate Professor in Computer Science in 2012. His current research areas include software engineering of distributed systems, graphs grammars, self-adaptatitive and pervasive systems, autonomic middleware.

Slim Kallel received his Diploma of Engineering and Master degree in Computer Science from National Engineering School of Sfax (Tunisia) in 2005 and PhD from Darmstadt University of Technology (Germany) in 2011. He joined the Faculty of Economics and Management (Tunisia) as an Assistant Professor of Computer Science in 2009. He became an Associate Professor in 2012. His work focused on the specification and the implementation of adaptive software systems.

Flavio Oquendo is a Full Professor of Computer Science and Software Engineering (holding a Research Excellence Award) at the Univ. de Bretagne-Sud, France. He is the Head of the IRISA's Research Team on Software Architecture. He received his BEng from ITA, Sao Paulo, and MSc, PhD and HDR from the Univ. de Grenoble. He has published over 150 refereed journal and conference papers and has been editor of over 15 journal special issues and books. He has served on programme committees of over 100 international conferences, e.g., ICSE, ESEC/FSE, has chaired ten of them, of which the French, European, and IEEE/IFIP International Conferences on Software Architecture. His research interests are centred on formal languages, processes and tools to support the efficient architecture of complex software-intensive systems and systems-of-systems.

1 Introduction

This issue presents extended versions of eight papers selected from the third track on Adaptive and Reconfigurable Service-oriented and Component-based Applications and Architectures (AROSA), which held in conjunction with the 22nd IEEE WETICE 2013 Conference.

This issue addresses different problems related to autonomous and adaptive systems including checkpointing, architecture adaptation, distributed algorithms design, privacy protection, fault tolerance, M2M architectures, web service composition, and mobility management.

All accepted papers were originated from co-authors of five countries (Canada, Egypt, France, Mexico, and Tunisia). Each submission was reviewed at least by three reviewers. The reviewing process was based on three steps: The First one is the selection of the high quality papers presented in AROSA 2014. The second step consists in taking decision on the extended version of the selected papers: provide reviewer's recommendations to improve the quality of the papers or definitively reject them. The last step is the verification of the revised versions by the reviewers and the selection of the high-quality articles were finally accepted to be included in the special issue.

2 Content of the issue

The paper of Alberto Calixto Simón et al. presents a delayed checkpoint approach for communication-induced checkpointing (delayed CIC) suitable for autonomic distributed systems. The authors propose an algorithm that reduces forced checkpoints by using the triggering rules called safe checkpoint conditions. These conditions allow a component to identify when a forced checkpoint can be delayed or removed. The proposed approach was simulated by using ChkSim and compared with other CIC algorithms to check it performance.

The paper of Djamel Belaïd et al. introduces fine-grained template adapters which are integrated into the application architecture to allow its adaptation autonomously. The article shows how the use of the template facilitates the creation and the integration of adapters into an application's architecture. The authors use Event-B to formally check the correctness of the integration.

The paper of Mohamed Tounsi et al. presents a complete and formal setting for the design of distributed algorithms. The main contribution of the paper is the proposition of a java code generator for Event-B models. These models are produced from local computation models describing distributed systems. Thus, the generator produces formally modelled and proved Java code for a distributed system thanks to the developed system namely B2VISIDIA.

The paper of David S. Allison et al. clarifies the background and requirement of privacy protection, and then presents a privacy framework based on the generic ontology that allows framework adaptation to several domains. The framework provides a set of privacy management functions that assist the user. The paper presents also a solution to protect and preserve sensitive data during collaborative tasks.

The paper of Wafa Gabsi et al. proposes a development process to integrate fault tolerance concerns since the modelling phase. The authors chose the AADL language to model systems as it gives the users the opportunity to describe functional concerns as well as cross-cutting ones like fault tolerance preoccupations. To model fault tolerance preoccupations, the author use the error model annex that offers the specification of all classes of faults, its propagation, its detection as well as its recovery. The authors propose also the code generators for both preoccupations. The authors extend the aspect language AspectAda with respect to real-time requirements to implement fault tolerance requirements.

Cédric Eichler et al. propose a formal framework for modelling M2M architectures based on the top of the ETSI M2M standard which provides a standardised framework for M2M communications and guarantee interoperability between machines. This standard does not address the issue of dynamic reconfiguration. Hence, authors introduce generic policies of reconfiguration to enforce self-management properties of M2M communications. The authors propose a graph-based approach which presents a formal layer composed by a generic graph grammar where vertices represent a device, an application or a container, links represent communication between these entities and a set of productions ensuring the communication between this formal layer and the functional layer (physical entities). For the generic policies of reconfiguration, authors rely on graph rewriting.

The paper of Mohamed Sellami et al. addresses inconsistencies and conflicts, which occur during service composition. Three aspects of the mediation are considered: syntactic (syntax differences), structural (data described using different schemas) and semantic (data interpretation). Conflict resolution is achieved by means of distributed mediation services where consistent hashing approach is used to setup a distributed service registry and allow service discovery.

The paper of Amine Dhraief et al. describes an extend their HIP-based M2M overlay network (HBMON) with a solution to manage the mobility of M2M devices. This solution performs two strategies: the first strategy (regular HBMON mobility) is an enhanced version of the HIP mobility management. Whereas, the second one is not based on the regular HIP mobility management. With this strategy, LocationUpdate and ContextUpdate packets are combined into a single message. An analytical model to evaluate the signalling cost of the proposed solution is presented. Both strategies on the OMNeT++ network simulator to evaluate the application recovery time of an M2M device experiencing a mobility episode are presented. Both signalling cost analysis and

performance evaluation through simulation show that the lightweight mobility support strategy significantly out-performs regular HIP.

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