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Preface

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The vision of "Internet as a computer" motivates many technical trends, like pervasive computing, grid computing, service computing and recently, cloud computing, as well as some business trends, like modern service industry, digital economy and smarter planet. These evolutionary changes demand that the software systems which are running on the open and dynamic Internet have to be autonomous, context-sensitive, continuous-reactive, evolutionary, and proactive, and the software entities dispersed on distributed nodes over the Internet will be turned into self-contained, autonomous and adaptive. Thus, like the information Web, i.e. the World Wide Web, these Internet-based software entities will constitute a software Web. That gives birth a new software paradigm. A portmanteau term "Internetware" is used to denote the future software-web. An Internetware system will be able to perceive the changes of the open and dynamic environment, respond to the changes, and exhibit the context-aware, adaptive and trustworthy behaviors. The mission of Internetware may challenge many aspects of software technologies, from the operating platforms and the programming models to the engineering approaches. Internetware 2010, the second Asia-Pacific Symposium on Internetware, aims to provide an interactive forum where researchers and professionals from multiple disciplines and domains meet and exchange ideas to explore and address the challenges brought by Internetware. The symposium was held at Suzhou, China, during the 2-4 of Nov, 2010. Thirty three papers were submitted and each of them was reviewed by at least two members of an International Program Committee. Among them, 12 have been accepted (which means an acceptance rate of 36%) for their quality as well as for their interesting terms of discussions for the symposium attendees.

This special issue contains 7 revised and substantially extended papers from the 12 based on presentations at the symposium:

In *Confidentiality Protection in Cloud Computing Systems*, Stephen S. Yau and Ho G. An proposed a new approach for protecting the confidentiality of users' data from service providers, and ensuring that service providers cannot access or disclose users' confidential data being processed and stored in cloud computing systems. Their approach has three major feature: 1) separating software service providers and infrastructure service providers in cloud computing, 2) hiding information of the owners

of data, and 3) data obfuscation. Experimental results are given to show that their approach has reasonable performance.

In *An Internetware Based Approach to Building Web Page Integration Applications for Mobile Devices*, Tianwei Sun, Feng Xu and Jian Lü proposed an approach based on Internertware to building web page integration applications for mobile device. They introduced a framework that provides abundant Internet programmable interfaces, a flexible integration mechanism to meet the users' rapid changing requirements and a reliable mechanism that guarantees the quality of the referred resources effectively.

In *Integrating MOF-Compliant Analysis Results*, Xiangping Chen, Gang Huang, Franck Chauvel, Yanchun Sun and Hong Mei proposed an MOF-based framework enabling the integration of analysis results. The main contributions of this paper include: a) defining a meta-model to capture the integration requirements, b) providing an MOF meta-model extension mechanism with support for upward compatibility; and c) automatically generating a model transformation for model integration. This paper also illustrates how to use this framework to integrate a reliability analysis method and a fault tolerant reconfiguration method within the ABC/ADL Software Architecture. The integration result has been applied onto the ECPerf JEE system.

In *An Agent Based Framework for Internetware Computing*, Liwei Zheng, Jian Tang and Zhi Jin proposed an agent based Internetware modeling approach. For conducting the agent-oriented Internetware modeling, three types of agents with different responsibilities are needed. They are the capability providing agents, the task planning agents and the task request agents. A software capability conceptualization is proposed and based on this different types of agents communicate and collaborate with each others to produce a feasible coalition. The authors also model the collaboration of these agents as an assignment problem and express it as a Kripke structure with normative systems and a negotiation based approach has been configured for the agent based Internetware modeling.

In *Sequential Event Pattern Based Design of Context-Aware Adaptive Application*, Chushu Gao, Jun Wei, Chang Xu and S.C. Cheung discussed some new challenges in context-awareness software design and verification such as the poor expressive to address the adaptations caused by asynchronous context updating, and missing or faulty context reading. Then they tackled these challenges at design stage by introducing sequential event patterns in adaptation rules to eliminate faulty and unwanted adaptations with features provided in the event pattern query language. The authors illustrated this approach using the recent published examples of adaptive applications, and shown that it is promising on designing more reliable context-aware adaptive applications.

In *Data Partitioning and Redundancy Management for Robust Multi-Tenancy SaaS*, Wei-Tek Tsai, Yu Huang, Qihong Shao and Xiaoying Bai proposed a hybrid test database design to support SaaS customization with two-layer database partitioning. The database is further extended with a new built-in redundancy with ontology so that the SaaS can recover from ontology, data or metadata failures. Furthermore, constraints in meta-data can be used either as test cases or policies to support SaaS continuous testing and policy enforcement.

In *Middleware Support for Internetware: A Service Perspective*, Chunyang Ye,

Jun Wei, Hua Zhong and Tao Huang exploited the needs of middleware support for Internet-based applications from a service perspective, investigate the potential requirements and features of Internetware, and the state-of-the-art solutions. Finally the authors also analyzed the remaining issues, the challenges and potential future research directions.

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