

Preface

Recent advances in information and communication technologies (ICT) such as computing, storage, and networking have led to the development of a new generation of electronic services and systems that are ubiquitous, available at the touch of a button, and affect all aspects of life and economy. Cloud computing, one of the ICT advances, provides an important integration of many of these aspects — combining both the ability to offer services over distributed, remotely accessed infrastructure, along with the ability to combine off-site, remote infrastructure with local infrastructure available within an institution. It is therefore expected that cloud-based services will revolutionize the way we do business, maintain our health, conduct education, and how we secure, protect, inform, and entertain ourselves.

Increasing integration across multiple types of computing infrastructure and the deployment of services across such infrastructure lead to significant design, development, and management challenges. For instance, how should such remote resources be managed, accessed, and paid for? Or how can cloud computing platforms be used to host and manage large and complex data sets (aka big data) — arising from social media data feeds (e.g., Twitter), open government data, to large-scale scientific simulations? Owing to the significant development effort invested into cloud systems, there is a pressing need to re-visit existing design, development, and management strategies so that dynamic adaptability, rapid delivery, and efficient access to cloud-based services can take place in a seamless manner.

A variety of intelligent mechanisms and techniques may be used to develop advanced cloud systems, solutions, and services that offer new functionalities and more advanced user-centric services. Implementing intelligence in cloud computing systems will make them more adaptive, exible, and autonomic in resource management, in service provisioning, and in running large-scale applications. In addition, it will help organizations build an intelligent network capable of providing security, visibility, and optimization for a better user experience.

The objective of the First International Conference on Intelligent Cloud Computing: Theory and Applications (ICC 2014) was to bring together researchers, practitioners, and developers working with cloud systems and intelligent systems, intending to address some of the challenges identified above. The conference featured invited talks from leading organizations working in cloud computing in Oman (such as Omantel and the Information Technology Authority) and in the region (such as the Qatar Computing Research Institute and Huawei Technologies Middle East). The conference had 131 registered participants, many hailing from ministries and leading research universities in Oman, which demonstrates a significant interest in cloud computing in the region.

The current volume contains all papers presented at the conference, which were subsequently updated based on discussions and comments from the audience, in the areas of “Resource Management and Energy Efficiency” and “Security” — both key research challenges at present. We thank all reviewers for their timely contributions, and the authors and keynote speakers for presenting their work at the conference.

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