Introduction to the IEEE CEC 2011 Workshop Clouds for Enterprises (C4E) 2011

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***Abstract*—Cloud computing technologies enable the provisioning of computing infrastructure/resources, platforms, and software applications over the Internet. Using clouds can help improve scalability and flexibility of computing infrastructure and reduce its total cost of ownership as they can be bought on demand. However, a variety of challenges arise in complex and dynamic cloud-based systems that are becoming frequent in enterprises and governments. The goal of the IEEE CEC 2011 workshop Clouds for Enterprises (C4E) 2011 is to contribute to the multi-perspective exchange of knowledge and ideas, dissemination of research results and the identification and analysis of open cloud research and adoption/exploitation issues. The workshop program consists of an invited keynote, 3 full and 5 short anonymously peer-reviewed research papers, and a discussion session.**

Keywords-cloud computing; enterprise computing; migration to cloud; contract; quality of service; cloud security; telecom applications; enterprise ecosystems.

I. CHALLENGES IN USING CLOUD COMPUTING

Cloud computing is an increasingly popular computing paradigm aiming to streamline on-demand provisioning of software (SaaS), platform (PaaS), infrastructure (IaaS), and data (DaaS) as services. Deploying applications on a cloud can help achieve scalability, improve flexibility of computing infrastructure and reduce total cost of ownership. However, a variety of challenges arise when deploying and operating applications and services in complex and dynamic cloud-based environments, which are becoming frequent in enterprises and governments.

Examples of such challenges are:

- the integration of collaborative services deployed locally and on different clouds;
- the integration of cloud services offering varying granularity and abstraction levels with other enterprise/government business functionalities and services to implement efficient business workflows;
- where and how to deploy parts of complex business processes (i.e. on-premises vs. on different remote clouds);
- the enforcement of security, privacy, and trust;
- how to guarantee the required level of dependability in a cost-effective way;
- the seamless integration of human "services" in large and complex clouds;
- how to monitor, manage and guarantee service level agreements (SLAs) of cloud deployments;
- exception handling for long-running transactions across loosely coupled services on clouds; and
- the governance and compliance of systems (cloud and non-cloud).

The security and privacy concerns with public cloud offerings (which first attracted widespread attention) means it is likely that many enterprises and governments will choose a combination of hybrid, community, and (particularly in the near future) private cloud solutions. Multi-tier infrastructures like these not only promise vast opportunities for future business models and new types of integrated business services, but also pose technical and organizational problems.

II. WORKSHOP PROGRAM

The goal of the Clouds for Enterprises (C4E) 2011 workshop is to bring together academic, industrial, and government researchers, developers, and IT managers interested in cloud computing technologies and/or their application in enterprises and governments. We aim to contribute to the multi-perspective exchange of knowledge and ideas, dissemination of results about completed and on-going research projects, as well as identification and analysis of open cloud computing research and adoption/exploitation issues.

The workshop is held within the 13th IEEE Conference on Commerce and Enterprise Computing (IEEE CEC 2011). The main program of the IEEE CEC 2011 conference also contains several peer-reviewed research papers related cloud computing and its use in enterprises and governments. In this way, the Clouds for Enterprises (C4E) 2011 workshop and the main program of the IEEE CEC 2011 conference complement and strengthen each other.

We have composed an interesting and diverse workshop program, containing of 1 keynote, presentations of 3 full (mature work) and 5 short (work-in-progress) peer-reviewed papers, and an open discussion session. The workshop keynote "Blueprinting the Cloud" is by the well-known services computing expert Prof. dr. Willem-Jan van den Heuvel (European Research Institute in Service Science – ERISS, Tilburg University, the Netherlands).

Research papers were selected for the workshop after a thorough peer-review by workshop Program Committee members and external reviewers. (An illustration of the international nature of the workshop is that Program Committee members and paper authors come from a variety of countries on 5 continents.) Every paper was reviewed by 4 to 5 international experts whose identity was not revealed to the authors. The selection process was competitive and only a subset of submissions was accepted into the workshop program. The topics covered by the selected 3 full and 5 short papers are diverse. They include migration of applications to clouds, security in cloud-based systems, quality of service (QoS) and prices of cloud services, use of clouds for telecom applications, and other topics. In addition to this diversity, there are also some overlaps in paper topics, so some topics are examined in several papers from different perspectives.

The final component of the workshop program is the discussion session "Migrating Enterprise/Government Applications to Clouds: Experiences and Challenges" moderated by A/Prof. Roch H. Glitho (Concordia University, Canada). Unfortunately, the process of migrating applications to clouds can be significantly more complicated than presented in marketing materials of cloud vendors. There are a number of factors that can affect the migration process. In this discussion session, all workshop participants will be invited to share their knowledge, experiences, and opinions. One possible result of the discussion could be a list of some of the factors that can impact migration of applications to clouds.

To conclude, we hope that the papers, presentations, and discussions at the Clouds for Enterprises (C4E) 2011 workshop will inspire further research and development in the important and exciting area of development and adoption/exploitation of cloud-based solutions in enterprises and governments.

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