

**ICAC '13:**  
**10th International Conference on Autonomic Computing**  
**June 26–28, 2013**  
**San Jose, CA**

Message from the Program Co-Chairs. . . . . viii

**Wednesday, June 26, 2013**

**Cloud Management**

**Application Placement and Demand Distribution in a Global Elastic Cloud: A Unified Approach . . . . .1**  
Hangwei Qian, *VMware, Inc.*; Michael Rabinovich, *Case Western Reserve University*

**To Reserve or Not to Reserve: Optimal Online Multi-Instance Acquisition in IaaS Clouds . . . . .13**  
Wei Wang, Baochun Li, and Ben Liang, *University of Toronto*

**Elasticity in Cloud Computing: What It Is, and What It Is Not . . . . .23**  
Nikolas Roman Herbst, Samuel Kounev, and Ralf Reussner, *Karlsruhe Institute of Technology*

**K-Scope: Online Performance Tracking for Dynamic Cloud Applications . . . . .29**  
Li Zhang, Xiaoqiao Meng, Shicong Meng, and Jian Tan, *IBM T.J. Watson Research Center*

**System Resource Management**

**Adaptive Performance-Aware Distributed Memory Caching . . . . .33**  
Jinho Hwang and Timothy Wood, *The George Washington University*

**Exploiting Processor Heterogeneity for Interactive Services . . . . .45**  
Shaolei Ren, *Florida International University*; Yuxiong He, Sameh Elnikety, and Kathryn S. McKinley, *Microsoft Research*

**Autonomic Management of Dynamically Partially Reconfigurable FPGA Architectures Using Discrete Control . . . . .59**  
Xin An and Eric Rutten, *Inria Grenoble Rhône-Alpes*; Jean-Philippe Diguët and Nicolas le Griguer, *Lab-STICC*; Abdoulaye Gamatié, *LIRMM*

**FMEM: A Fine-grained Memory Estimator for MapReduce Jobs . . . . .65**  
Lijie Xu, *Institute of Software, Chinese Academy of Sciences, and University of Chinese Academy of Sciences*; Jie Liu and Jun Wei, *Institute of Software, Chinese Academy of Sciences*

**Virtual Machine Management**

**AGILE: Elastic Distributed Resource Scaling for Infrastructure-as-a-Service . . . . .69**  
Hiep Nguyen, Zhiming Shen, and Xiaohui Gu, *North Carolina State University*; Sethuraman Subbiah, *NetApp Inc.*; John Wilkes, *Google Inc.*

**PACMan: Performance Aware Virtual Machine Consolidation . . . . .83**  
Alan Roytman, *University of California, Los Angeles*; Aman Kansal, *Microsoft Research*; Sriram Govindan, *Microsoft Corporation*; Jie Liu and Suman Nath, *Microsoft Research*

**Working Set-based Physical Memory Ballooning . . . . .95**  
Jui-Hao Chiang, *Stony Brook University*; Han-Lin Li and Tzi-cker Chiueh, *Industrial Technology Research Institute*

**Coriolis: Scalable VM Clustering in Clouds . . . . .101**  
Daniel Campello and Carlos Crespo, *Florida International University*; Akshat Verma, *IBM Research-India*; Raju Rangaswami, *Florida International University*; Praveen Jayachandran, *IBM Research-India*

## Thursday, June 27, 2013

### MapReduce Workloads and Key-Value Stores

**iShuffle: Improving Hadoop Performance with Shuffle-on-Write** .....107  
Yanfei Guo, Jia Rao, and Xiaobo Zhou, *University of Colorado, Colorado Springs*

**AUTOPLACER: Scalable Self-Tuning Data Placement in Distributed Key-value Stores** ..... 119  
João Paiva, Pedro Ruivo, Paolo Romano, and Luís Rodrigues, *INESC-ID Lisboa, Instituto Superior Técnico, and Universidade Técnica de Lisboa*

**Adaptive Information Passing For Early State Pruning in MapReduce Data Processing Workflows** .....133  
Seokyoung Hong, Padmashree Ravindra, and Kemafor Anyanwu, *North Carolina State University*

### Management of Big Data Systems Track

**To Auto Scale or Not to Auto Scale** .....145  
Nathan D. Mickulicz, Priya Narasimhan, and Rajeev Gandhi, *YinzCam, Inc. and Carnegie Mellon University*

**Big Data Exploration via Automated Orchestration of Analytic Workflows** .....153  
Alina Beygelzimer, Anton Riabov, Daby Sow, Deepak S. Turaga, and Octavian Udrea, *IBM T. J. Watson Research Center*

**ThroughputScheduler: Learning to Schedule on Heterogeneous Hadoop Clusters** .....159  
Shekhar Gupta, Christian Fritz, Bob Price, Roger Hoover, and Johan DeKleer, *Palo Alto Research Center;*  
Cees Witteveen, *Delft University of Technology*

**Real-Time User-Centric Management of Time-Intensive Analytics Using Convergence of Local Functions** . . .167  
Vinay Deolalikar, *HP-Autonomy Research*

**AutoTune: Optimizing Execution Concurrency and Resource Usage in MapReduce Workflows** ..... 175  
Zhuoyao Zhang, *University of Pennsylvania;* Ludmila Cherkasova, *Hewlett-Packard Labs;* Boon Thau Loo, *University of Pennsylvania*

### Self-Aware Internet of Things Track

**Self-healing and Optimizing of the HIP-based M2M Overlay Network** .....183  
Amine Dhraief, *HANA Research Group, University of Manouba;* Khalil Drira, *LAAS-CNRS, University of Toulouse;* Abdelfettah Belghith, *HANA Research Group, University of Manouba*

**Between Neighbors: Neighbor Discovery Analysis in EH-IoTs** .....193  
Shruti Devasenapathy, Vijay S. Rao, R. Venkatesha Prasad, and Ignas Niemegeers, *Delft University of Technology;* Abdur Rahim, *CreateNet*

**Towards a Generic Architecture and Methodology for Multi-goal, Highly-distributed and Dynamic Autonomic Systems** .....201  
Sylvain Frey, *EDF R&D and Télécom ParisTech, CNRS LTCI;* Ada Diaconescu, *Télécom ParisTech, CNRS LTCI;* David Menga, *EDF R&D;* Isabelle Demeure, *Télécom ParisTech, CNRS LTCI*

**Learning Deployment Trade-offs for Self-Optimization of Internet of Things Applications** .....213  
Arun kishore Ramakrishnan, Nayyab Zia Naqvi, Zubair Wadood Bhatti, Davy Preuveneers, and Yolande Berbers, *KU Leuven*

# Friday, June 29, 2013

## Self-Protect/Self-Healing

- Autonomic Fail-over for a Software-Defined Container Computer Network. ....225**  
Chien-Yung Lee and Yu-Wei Lee, *Industrial Technology Research Institute*; Cheng-Chun Tu, *Stony Brook University and Industrial Technology Research Institute*; Pai-Wei Wang, Yu-Cheng Wang, and Chih-Yu Lin, *Industrial Technology Research Institute*; Tzi-cker Chiueh, *Stony Brook University and Industrial Technology Research Institute*
- Fault Management in Map-Reduce through Early Detection of Anomalous Nodes .....235**  
Selvi Kadirvel, Jeffrey Ho, and José A. B. Fortes, *University of Florida*
- Reliability and Timeliness Analysis of Fault-tolerant Distributed Publish/Subscribe Systems .....247**  
Thadpong Pongthawornkamol and Klara Nahrstedt, *University of Illinois at Urbana-Champaign*; Guijun Wang, *Boeing Research & Technology*
- Mitigating Anonymity Challenges in Automated Testing and Debugging Systems. ....259**  
Silviu Andrica and George Candea, *École Polytechnique Fédérale de Lausanne (EPFL)*

## Scheduling

- Zoolander: Efficiently Meeting Very Strict, Low-Latency SLOs. ....265**  
Christopher Stewart and Aniket Chakrabarti, *The Ohio State University*; Rean Griffith, *VMware*
- Preemptive ReduceTask Scheduling for Fair and Fast Job Completion .....279**  
Yandong Wang, *Auburn University*; Jian Tan, *IBM T.J. Watson Research*; Weikuan Yu, *Auburn University*; Li Zhang and Xiaoqiao Meng, *IBM T.J. Watson Research*
- QoS-Aware Admission Control in Heterogeneous Datacenters .....291**  
Christina Delimitrou, Nick Bambos, and Christos Kozyrakis, *Stanford University*
- Performance Inconsistency in Large Scale Data Processing Clusters .....297**  
Mingyuan Xia and Nan Zhu, *McGill University*; Yuxiong He and Sameh Elnikety, *Microsoft Research Redmond*; Xue Liu, *McGill University*

## Power/Temperature-Aware Management

- Temperature Aware Workload Management in Geo-distributed Datacenters .....303**  
Hong Xu, Chen Feng, and Baochun Li, *University of Toronto*
- Power-Aware Throughput Control for Database Management Systems .....315**  
Zichen Xu and Xiaorui Wang, *The Ohio State University*; Yi-Cheng Tu, *University of South Florida*
- Wireless Inference-based Notification (WIN) without Packet Decoding .....325**  
Kevin Chen and H. T. Kung, *Harvard University*