

# **2012 IEEE Fifth International Conference on Cloud Computing (CLOUD 2012)**

**Honolulu, Hawaii, USA  
24 – 29 June 2012**

**Pages 1-501**



**IEEE Catalog Number: CFP12CLO-PRT  
ISBN: 978-1-4673-2892-0**

# 2012 IEEE Fifth International Conference on Cloud Computing

## CLOUD 2012

### Table of Contents

<b>Message from the General Chairs and Program Chairs</b> .....	xix
<b>Organizing Committee</b> .....	xx
<b>Program Committee</b> .....	xxii
<b>External Reviewers</b> .....	xxv
<b>IEEE Computer Society Technical Committee on Services Computing (TC-SVC)</b> .....	xxvi

---

## Research Track

### Research Track 1: Cloud Framework

MROrchestrator: A Fine-Grained Resource Orchestration Framework for MapReduce Clusters .....	1
<i>Bikash Sharma, Ramya Prabhakar, Seung-Hwan Lim, Mahmut T. Kandemir, and Chita R. Das</i>	
A General and Practical Datacenter Selection Framework for Cloud Services .....	9
<i>Hong Xu and Baochun Li</i>	
A Profit-Aware Virtual Machine Deployment Optimization Framework for Cloud Platform Providers .....	17
<i>Wei Chen, Xiaoqiang Qiao, Jun Wei, and Tao Huang</i>	

### Research Track 2: Admission Control for Cloud Services

Biting Off Safely More Than You Can Chew: Predictive Analytics for Resource Over-Commit in IaaS Cloud .....	25
<i>Rahul Ghosh and Vijay K. Naik</i>	
WIQ: Work-Intensive Query Scheduling for In-Memory Database Systems .....	33
<i>Stephan Kraft, Giuliano Casale, Alin Jula, Peter Kilpatrick, and Des Greer</i>	

Admission Control for Elastic Cloud Services .....	41
<i>Kleopatra Konstanteli, Tommaso Cucinotta, Konstantinos Psychas, and Theodora Varvarigou</i>	

### **Research Track 3: Analytics Cloud Platform**

Center-of-Gravity Reduce Task Scheduling to Lower MapReduce Network Traffic .....	49
<i>Mohammad Hammoud, M. Suhail Rehman, and Majd F. Sakr</i>	
Efficient Map/Reduce-Based DBSCAN Algorithm with Optimized Data Partition .....	59
<i>Bi-Ru Dai and I-Chang Lin</i>	
Evaluating Hadoop for Data-Intensive Scientific Operations .....	67
<i>Zacharia Fadika, Madhusudhan Govindaraju, Richard Canon, and Lavanya Ramakrishnan</i>	

### **Research Track 4: Economic Models for Cloud Computing**

Optimal Bids for Spot VMs in a Cloud for Deadline Constrained Jobs .....	75
<i>Murtaza Zafer, Yang Song, and Kang-Won Lee</i>	
Maximizing Cloud Provider Profit from Equilibrium Price Auctions .....	83
<i>Ulrich Lampe, Melanie Siebenhaar, Apostolos Papageorgiou, Dieter Schuller, and Ralf Steinmetz</i>	
Towards Optimal Bidding Strategy for Amazon EC2 Cloud Spot Instance .....	91
<i>ShaoJie Tang, Jing Yuan, and Xiang-Yang Li</i>	

### **Research Track 5: Managed Cloud Platform**

Attribution of Fraudulent Resource Consumption in the Cloud .....	99
<i>Joseph Idziorek, Mark Tannian, and Doug Jacobson</i>	
GARDEN: Generic Addressing and Routing for Data Center Networks .....	107
<i>Yan Hu, Ming Zhu, Yong Xia, Kai Chen, and Yanlin Luo</i>	

### **Research Track 6: Collaborative Cloud Computing**

Expertus: A Generator Approach to Automate Performance Testing in IaaS Clouds .....	115
<i>Deepal Jayasinghe, Galen Swint, Simon Malkowski, Jack Li, Qingyang Wang, Junhee Park, and Calton Pu</i>	
F2Box: Cloudifying F2F Storage Systems with High Availability Correlation .....	123
<i>Raúl Gracia-Tinedo, Marc Sánchez-Artigas, and Pedro García-López</i>	
FriendBox: A Hybrid F2F Personal Storage Application .....	131
<i>Raúl Gracia-Tinedo, Marc Sánchez-Artigas, Adrián Moreno-Martínez, and Pedro García-López</i>	

## **Research Track 7: Analytics Cloud**

Scan-Sharing for Optimizing RDF Graph Pattern Matching on MapReduce .....	139
<i>HyeongSik Kim, Padmashree Ravindra, and Kemafor Anyanwu</i>	
Towards Quality Aware Collaborative Video Analytic Cloud .....	147
<i>JongHyuk Lee, Tao Feng, Weidong Shi, Apurva Bedagkar-Gala, Shishir K. Shah, and Hanako Yoshida</i>	
De Novo Assembly of High-Throughput Sequencing Data with Cloud Computing and New Operations on String Graphs .....	155
<i>Yu-Jung Chang, Chien-Chih Chen, Jan-Ming Ho, and Chuen-Liang Chen</i>	

## **Research Track 8: Cloud Performance Management**

Challenges and Opportunities in Consolidation at High Resource Utilization: Non-monotonic Response Time Variations in n-Tier Applications .....	162
<i>Simon Malkowski, Yasuhiko Kanemasa, Hanwei Chen, Masao Yamamoto, Qingyang Wang, Deepal Jayasinghe, Calton Pu, and Motoyuki Kawaba</i>	
A Performance Interference Model for Managing Consolidated Workloads in QoS-Aware Clouds .....	170
<i>Qian Zhu and Teresa Tung</i>	
Scheduling Parallel Tasks onto Opportunistically Available Cloud Resources .....	180
<i>Ting He, Shiyao Chen, Hyoil Kim, Lang Tong, and Kang-Won Lee</i>	

## **Research Track 9: Cloud Resource Management**

Energy Efficient Geographical Load Balancing via Dynamic Deferral of Workload .....	188
<i>Muhammad Abdullah Adnan, Ryo Sugihara, and Rajesh K. Gupta</i>	
Survivable Virtual Infrastructure Mapping in Virtualized Data Centers .....	196
<i>Jielong Xu, Jian Tang, Kevin Kwiat, Weiyi Zhang, and Guoliang Xue</i>	
Energy Management in IaaS Clouds: A Holistic Approach .....	204
<i>Eugen Feller, Cyril Rohr, David Margery, and Christine Morin</i>	

## **Research Track 10: Exploitation of Infrastructure-as-a-Service Clouds**

Cost-Efficient and Application SLA-Aware Client Side Request Scheduling in an Infrastructure-as-a-Service Cloud .....	213
<i>Philipp Leitner, Waldemar Hummer, Benjamin Satzger, Christian Inzinger, and Schahram Dustdar</i>	
SmartScale: Automatic Application Scaling in Enterprise Clouds .....	221
<i>Sourav Dutta, Sankalp Gera, Akshat Verma, and Balaji Viswanathan</i>	
Risk-Aware Workload Distribution in Hybrid Clouds .....	229
<i>Kerim Yasin Oktay, Vaibhav Khadilkar, Bijit Hore, Murat Kantarcioglu, Sharad Mehrotra, and Bhavani Thuraisingham</i>	

## **Research Track 11: Cloud Resource Provisioning**

Opportunistic Service Provisioning in the Cloud .....	237
<i>Mathias Björkqvist, Lydia Y. Chen, and Walter Binder</i>	
Performance of Cloud Computing Centers with Multiple Priority Classes .....	245
<i>Wendy Ellens, Miroslav Živković, Jacob Akkerboom, Remco Litjens, and Hans van den Berg</i>	
An Online Mechanism for Dynamic VM Provisioning and Allocation in Clouds .....	253
<i>Sharrukh Zaman and Daniel Grosu</i>	

## **Research Track 12: Virtual Server Image Management**

Impact of Live Migration on Multi-tier Application Performance in Clouds .....	261
<i>Shinji Kikuchi and Yasuhide Matsumoto</i>	
Minimizing Latency in Serving Requests through Differential Template Caching in a Cloud .....	269
<i>Deepak Jeswani, Manish Gupta, Pradipta De, Arpit Malani, and Umesh Bellur</i>	
Semantically-Rich Composition of Virtual Images .....	277
<i>Fábio Oliveira, Tamar Eilam, Michael Kalantar, and Florian Rosenberg</i>	

## **Research Track 13: Cloud Privacy**

Keeping Data Private while Computing in the Cloud .....	285
<i>Yuriy Brun and Nenad Medvidovic</i>	
Oruta: Privacy-Preserving Public Auditing for Shared Data in the Cloud .....	295
<i>Boyang Wang, Baochun Li, and Hui Li</i>	
CloudProtect: Managing Data Privacy in Cloud Applications .....	303
<i>Mamadou H. Diallo, Bijit Hore, Ee-Chien Chang, Sharad Mehrotra, and Nalini Venkatasubramanian</i>	

## **Research Track 14: Cloud Application Deployment**

Efficient Deployment of Main-Memory DBMS in Virtualized Data Centers .....	311
<i>Michael Seibold, Andreas Wolke, Martina Albutiu, Martin Bichler, Alfons Kemper, and Thomas Setzer</i>	
Topology-Aware Deployment of Scientific Applications in Cloud Computing .....	319
<i>Pei Fan, Zhenbang Chen, Ji Wang, Zibin Zheng, and Michael R. Lyu</i>	
Placement in Clouds for Application-Level Latency Requirements .....	327
<i>Fangzhe Chang, Ramesh Viswanathan, and Tom L. Wood</i>	

## **Research Track 15: Cloud Exploitation Analysis**

Data Centers in the Cloud: A Large Scale Performance Study .....	336
<i>Robert Birke, Lydia Y. Chen, and Evgenia Smirni</i>	
Towards a Taxonomy of Performance Evaluation of Commercial Cloud Services .....	344
<i>Zheng Li, Liam O'Brien, Rainbow Cai, and He Zhang</i>	
Lessons Learnt from the Development of GIS Application on Azure Cloud Platform .....	352
<i>Dinesh Agarwal and S. K. Prasad</i>	

## **Research Track 16: Cloud SLA Management**

SLA-Based and Consumer-centric Dynamic Provisioning for Cloud Databases .....	360
<i>Sherif Sakr and Anna Liu</i>	
Self-Adaptive and Resource-Efficient SLA Enactment for Cloud Computing Infrastructures .....	368
<i>Michael Maurer, Ivona Brandic, and Rizos Sakellariou</i>	
An Integrated Approach for Specifying and Enforcing SLAs for Cloud Services .....	376
<i>André Lage Freitas, Nikos Parlavantzas, and Jean-Louis Pazat</i>	

## **Applications and Experiences Track**

### **Applications and Experiences Track 1: Cloud Federation**

A Semantic Scheduler Architecture for Federated Hybrid Clouds .....	384
<i>Idafen Santana-Pérez and María S. Pérez-Hernández</i>	
A Federated Multi-cloud PaaS Infrastructure .....	392
<i>Fawaz Paraiso, Nicolas Haderer, Philippe Merle, Romain Rouvoy, and Lionel Seinturier</i>	

## **Applications and Experiences Track 2: Mobile Cloud**

Resource Allocation for Cloud-Assisted Mobile Applications .....	400
<i>Marvin Ferber, Thomas Rauber, Mario Henrique Cruz Torres, and Tom Holvoet</i>	
Sharing-Aware Cloud-Based Mobile Outsourcing .....	408
<i>Chonglei Mei, Daniel Taylor, Chenyu Wang, Abhishek Chandra, and Jon Weissman</i>	
Service Image Placement for Thin Client in Mobile Cloud Computing .....	416
<i>Tien-Dung Nguyen, Mui Van Nguyen, and Eui-Nam Huh</i>	

## **Applications and Experiences Track 3: Cloud Performance**

A Performance Study on the VM Startup Time in the Cloud .....	423
<i>Ming Mao and Marty Humphrey</i>	
Sensor Data Storage Performance: SQL or NoSQL, Physical or Virtual .....	431
<i>Jan Sipke van der Veen, Bram van der Waaij, and Robert J. Meijer</i>	
Application-Level CPU Consumption Estimation: Towards Performance Isolation of Multi-tenancy Web Applications .....	439
<i>Wei Wang, Xiang Huang, Xiulei Qin, Wenbo Zhang, Jun Wei, and Hua Zhong</i>	

## **Applications and Experiences Track 4: Cloud Applications**

Accelerating MapReduce Analytics Using CometCloud .....	447
<i>Moustafa AbdelBaky, Hyunjoo Kim, Ivan Rodero, and Manish Parashar</i>	
Distributed Graph Database for Large-Scale Social Computing .....	455
<i>Li-Yung Ho, Jan-Jan Wu, and Pangfeng Liu</i>	
Abstract Image Management and Universal Image Registration for Cloud and HPC Infrastructures .....	463
<i>Javier Diaz, Gregor von Laszewski, Fugang Wang, and Geoffrey Fox</i>	

## **Applications and Experiences Track 5: Cloud Security**

Maitland: Lighter-Weight VM Introspection to Support Cyber-security in the Cloud .....	471
<i>Chris Benninger, Stephen W. Neville, Yağiz Onat Yazir, Chris Matthews, and Yvonne Coady</i>	
Defining and Implementing Connection Anonymity for SaaS Web Services .....	479
<i>Vinicius Pacheco and Ricardo Puttini</i>	
MANTICORE: Masking All Network Traffic via IP Concealment with OpenVPN Relaying to EC2 .....	487
<i>Patrick Butler, Adam Rhodes, and Ragib Hasan</i>	

## **Applications and Experiences Track 6: Cloud Application Security**

Hatman: Intra-cloud Trust Management for Hadoop .....	494
<i>Safwan Mahmud Khan and Kevin W. Hamlen</i>	
Programmable Order-Preserving Secure Index for Encrypted Database Query .....	502
<i>Dongxi Liu and Shenlu Wang</i>	

## **Applications and Experiences Track 7: Cloud Data Storage**

Cryptonite: A Secure and Performant Data Repository on Public Clouds .....	510
<i>Alok Kumbhare, Yogesh Simmhan, and Viktor Prasanna</i>	
Combining Query Performance with Data Integrity in the Cloud: A Hybrid Cloud Storage Framework to Enhance Data Access on the Windows Azure Platform .....	518
<i>Robert Neumann, Steve Taggeselle, Reiner Dumke, Andreas Schmietendorf, Florian Muhss, and Anja Fiegler</i>	
Cost-Based Data Consistency in a Data-as-a-Service Cloud Environment .....	526
<i>Ilir Fetai and Heiko Schuldt</i>	

## **Applications and Experiences Track 8: Data Processing and Management**

IncMR: Incremental Data Processing Based on MapReduce .....	534
<i>Cairong Yan, Xin Yang, Ze Yu, Min Li, and Xiaolin Li</i>	
Scalable Transaction Management with Snapshot Isolation on Cloud Data Management Systems .....	542
<i>Vinit Padhye and Anand Tripathi</i>	
Multi-level Selective Deduplication for VM Snapshots in Cloud Storage .....	550
<i>Wei Zhang, Hong Tang, Hao Jiang, Tao Yang, Xiaogang Li, and Yue Zeng</i>	

## **Applications and Experiences Track 9: Cloud Service Selection**

A Brokerage-Based Approach for Cloud Service Selection .....	558
<i>Smitha Sundaeswaran, Anna Squicciarini, and Dan Lin</i>	
QoS-Driven Service Selection for Multi-tenant SaaS .....	566
<i>Qiang He, Jun Han, Yun Yang, John Grundy, and Hai Jin</i>	



## **Applications and Experiences Track 10: Cloud Resource Optimization**

Improving Resource Utilisation in the Cloud Environment Using Multivariate Probabilistic Models .....	574
<i>Sijin He, Li Guo, Moustafa Ghanem, and Yike Guo</i>	
Portfolio Theory-Based Resource Assignment in a Cloud Computing System .....	582
<i>Inkwon Hwang and Massoud Pedram</i>	
Composite SaaS Placement and Resource Optimization in Cloud Computing Using Evolutionary Algorithms .....	590
<i>Zeratul Izzah Mohd Yusoh and Maolin Tang</i>	

## **Applications and Experiences Track 11: Resource Consolidation**

Risk Aware Provisioning and Resource Aggregation Based Consolidation of Virtual Machines .....	598
<i>Kishalay Halder, Umesh Bellur, and Purushottam Kulkarni</i>	
MiyakoDori: A Memory Reusing Mechanism for Dynamic VM Consolidation .....	606
<i>Soramichi Akiyama, Takahiro Hirofuchi, Ryousei Takano, and Shinichi Honiden</i>	
Autonomous Resource Consolidation Management in Clouds Using IMPROMPTU Extensions .....	614
<i>Yağiz Onat Yazir, Yağmur Akbulut, Roozbeh Farahbod, Adel Guitouni, Stephen W. Neville, Sudhakar Ganti, and Yvonne Coady</i>	

## **Applications and Experiences Track 12: Cloud Deployment**

Toward Realization of Deployment Variability for Software-as-a-Service Applications .....	622
<i>Stefan T. Ruehl, Urs Andelfinger, Andreas Rausch, and Stephan A.W. Verclas</i>	
A Latency-Aware Co-deployment Mechanism for Cloud-Based Services .....	630
<i>Yu Kang, Zibin Zheng, and Michael R. Lyu</i>	
Bi-criteria Workflow Tasks Allocation and Scheduling in Cloud Computing Environments .....	638
<i>Kahina Bessai, Samir Youcef, Ammar Oulamara, Claude Godart, and Selmin Nurcan</i>	

## **Applications and Experiences Track 13: Cloud Cost Models**

Impact of Storage Acquisition Intervals on the Cost-Efficiency of the Private vs. Public Storage .....	646
<i>Oleksiy Mazhelis, Gabriella Fazekas, and Pasi Tyrväinen</i>	
DICB: Dynamic Intelligent Customizable Benign Pricing Strategy for Cloud Computing .....	654
<i>Wei-Tek Tsai and Guanqiu Qi</i>	
Software Renting in the Era of Cloud Computing .....	662
<i>Arto Ojala</i>	

## **Applications and Experiences Track 14: Cloud Infrastructure**

A Remote I/O Solution for the Cloud .....	670
<i>Cynthia Taylor and Joseph Pasquale</i>	
XenPump: A New Method to Mitigate Timing Channel in Cloud Computing .....	678
<i>Jingzheng Wu, Liping Ding, Yuqi Lin, Nasro Min-Allah, and Yongji Wang</i>	
Peregrine: An All-Layer-2 Container Computer Network .....	686
<i>Tzi-cker Chiueh, Cheng-Chun Tu, Yu-Cheng Wang, Pai-Wei Wang, Kai-Wen Li, and Yu-Ming Huang</i>	

## **Applications and Experiences Track 15: Cloud Framework**

Cloud Guided Stream Classification Using Class-Based Ensemble .....	694
<i>Tahseen M. Al-Khateeb, Mohammad M. Masud, Latifur Khan, and Bhavani Thuraisingham</i>	

## **Applications and Experiences Track 16: Cloud Architecture**

Prototyping Efficient Desktop-as-a-Service for FPGA Based Cloud Computing Architecture .....	702
<i>Shi Shu, Xiang Shen, Yongxin Zhu, Tian Huang, Shunqing Yan, and Shiming Li</i>	
Pragmatic Integration of Cloud and Grid Computing Infrastructures .....	710
<i>Thomas Rings and Jens Grabowski</i>	
Scalability Patterns for Platform-as-a-Service .....	718
<i>Claudio A. Ardagna, Ernesto Damiani, Fulvio Frati, Davide Rebecconi, and Marco Ughetti</i>	

## **Applications and Experiences Track 17: Cloud Knowledge**

Capturing Cloud Computing Knowledge and Experience in Patterns .....	726
<i>Christoph Fehling, Thilo Ewald, Frank Leymann, Michael Pauly, Jochen Rüttschlin, and David Schumm</i>	
Comparison of Multiple Cloud Frameworks .....	734
<i>Gregor von Laszewski, Javier Diaz, Fugang Wang, and Geoffrey C. Fox</i>	
Formalizing the Cloud through Enterprise Topology Graphs .....	742
<i>Tobias Binz, Christoph Fehling, Frank Leymann, Alexander Nowak, and David Schumm</i>	

## **Applications and Experiences Track 18: Cloud Energy**

Energy-Efficient Virtual Machine Replication and Placement in a Cloud Computing System .....	750
<i>Hadi Goudarzi and Massoud Pedram</i>	
Carbon Metering and Effective Tax Cost Modeling for Virtual Machines .....	758
<i>Fereydoun Farrahi Moghaddam, Reza Farrahi Moghaddam, and Mohamed Cheriet</i>	
Energy-as-a-Service (EaaS): On the Efficacy of Multimedia Cloud Computing to Save Smartphone Energy .....	764
<i>Majid Altamimi, Rajesh Palit, Kshirasagar Naik, and Amiya Nayak</i>	

## **Applications and Experiences Track 19: Power Consumption Analysis**

Analysis of the Power and Hardware Resource Consumption of Servers under Different Load Balancing Policies .....	772
<i>Waltenegus Dargie and Alexander Schill</i>	
Analysis of the Power Consumption of a Multimedia Server under Different DVFS Policies .....	779
<i>Waltenegus Dargie</i>	
Experimental Analysis of Application Specific Energy Efficiency of Data Centers with Heterogeneous Servers .....	786
<i>Grace Metri, Soumyasudharsan Srinivasaraghavan, Weisong Shi, and Monica Brockmeyer</i>	

## **Applications and Experiences Track 20: Cloud Applications**

A Framework for Partitioning and Execution of Data Stream Applications in Mobile Cloud Computing .....	794
<i>Lei Yang, Jiannong Cao, Shaojie Tang, Tao Li, and Alvin T.S. Chan</i>	

Evaluating High Performance Computing on the Windows Azure Platform .....	803
<i>Eduardo Roloff, Francis Birck, Matthias Diener, Alexandre Carissimi, and Philippe O.A. Navaux</i>	

## Industry Track

### Industry Track 1: Cloud Application Performance

Synchronous Parallel Processing of Big-Data Analytics Services to Optimize Performance in Federated Clouds .....	811
<i>Gueyoung Jung, Nathan Gnanasambandam, and Tridib Mukherjee</i>	
Optimizing Sequence Alignment in Cloud Using Hadoop and MPP Database .....	819
<i>Senthilkumar Vijayakumar, Anjani Bhargavi, Uma Praseeda, and Syed Azar Ahamed</i>	
Optimizing JMS Performance for Cloud-Based Application Servers .....	828
<i>Zhenyun Zhuang and Yao-Min Chen</i>	

### Industry Track 2: Solutions for Virtualized Systems

Supporting Virtualization-Aware Security Solutions Using a Systematic Approach to Overcome the Semantic Gap .....	836
<i>Amani S. Ibrahim, James Hamlyn-Harris, John Grundy, and Mohamed Almarsy</i>	
Preemption-Aware Energy Management in Virtualized Data Centers .....	844
<i>Mohsen Amini Salehi, P. Radha Krishna, Krishnamurty Sai Deepak, and Rajkumar Buyya</i>	
VM Placement Strategies for Cloud Scenarios .....	852
<i>Nicolò Maria Calcavecchia, Ofer Biran, Erez Hadad, and Yosef Moatti</i>	

### Industry Track 3: Resource and Workload

Remediating Overload in Over-Subscribed Computing Environments .....	860
<i>Long Wang, Rafah A. Hosn, and Chunqiang Tang</i>	
Analysis of SaaS Business Platform Workloads for Sizing and Collocation .....	868
<i>Rajeshwari Ganesan, Santonu Sarkar, and Akshay Narayan</i>	
Minimum Cost Maximum Flow Algorithm for Dynamic Resource Allocation in Clouds .....	876
<i>Makhlouf Hadji and Djamel Zeglache</i>	

## Industry Track 4: Cloud Framework

A Systematic Framework Enabling Automatic Conflict Detection and Explanation in Cloud Service Selection for Enterprises .....	883
<i>Chunqing Chen, Shixing Yan, Guopeng Zhao, Bu Sung Lee, and Sharad Singhal</i>	
Introducing STRATOS: A Cloud Broker Service .....	891
<i>Przemyslaw Pawluk, Bradley Simmons, Michael Smit, Marin Litoiu, and Serge Mankovski</i>	
MedBook: A Cloud-Based Healthcare Billing and Record Management System .....	899
<i>Manuel Rodriguez-Martinez, Harold Valdivia, Jose Rivera, Jaime Seguel, and Melvin Greer</i>	

## Industry Track 5: Cloud Application Architecture

ReLoC: A Resilient Loosely Coupled Application Architecture for State Management in the Cloud .....	906
<i>Vibhu Saujanya Sharma, Shubhashis Sengupta, and Annervaz K.M.</i>	
Configuring a MapReduce Framework for Dynamic and Efficient Energy Adaptation .....	914
<i>Jessica Hartog, Zacharia Fadika, Elif Dede, and Madhusudhan Govindaraju</i>	
Application-Managed Replication Controller for Cloud-Hosted Databases .....	922
<i>Liang Zhao, Sherif Sakr, and Anna Liu</i>	

## Work-in-Progress Track

### Work-in-Progress Track 1: Cloud Scalability

An Availability-Aware Approach to Resource Placement of Dynamic Scaling in Clouds .....	930
<i>Wenting Wang, Haopeng Chen, and Xi Chen</i>	
How Do Cloud Capabilities Impact Various Aspects of IT Effectiveness? .....	932
<i>Shankar Babu Chebrolu</i>	
Automatic Resource Scaling Based on Application Service Requirements .....	941
<i>Ching-Chi Lin, Jan-Jan Wu, Jeng-An Lin, Li-Chung Song, and Pangfeng Liu</i>	
HSQL: A Highly Scalable Cloud Database for Multi-user Query Processing .....	943
<i>Chao-Rui Chang, Meng-Ju Hsieh, Jan-Jan Wu, Po-Yen Wu, and Pangfeng Liu</i>	

## **Work-in-Progress Track 2: Cloud Monitoring**

A Tiered Strategy for Auditing in the Cloud .....	945
<i>Rui Xie and Rose Gamble</i>	
CloudMonitor: Profiling Power Usage .....	947
<i>James William Smith, Ali Khajeh-Hosseini, Jonathan Stuart Ward, and Ian Sommerville</i>	
Facilitating Business-Oriented Cloud Transformation Decision with Cloud Transformation Advisor .....	949
<i>Fan Jing Meng, Jian Wang, Changhua Sun, Dong Xu Duan, and Yi-Min Chee</i>	
Reliable State Monitoring in Cloud Datacenters .....	951
<i>Shicong Meng, Arun K. Iyengar, Isabelle M. Rouvellou, Ling Liu, Kisung Lee, Balaji Palanisamy, and Yuzhe Tang</i>	
Increasing Spot Instances Reliability Using Dynamic Scalability .....	959
<i>Wesam Dawoud, Ibrahim Takouna, and Christoph Meinel</i>	

## **Work-in-Progress Track 3: Cloud Applications**

Service Provisioning for the WSN Cloud .....	962
<i>Muhammad Sohaib Aslam, Susan Rea, and Dirk Pesch</i>	
A Multi-tenant Web Application Framework for SaaS .....	970
<i>Wonjae Lee and Min Choi</i>	
A Framework for Classification of Resource Consolidation Management Problems .....	972
<i>Steven Loneragan, Yağiz Onat Yazir, and Ulrike Stege</i>	
Energy-Price-Driven Request Dispatching for Cloud Data Centers .....	974
<i>Takumi Sakamoto, Hiroshi Yamada, Hikaru Horie, and Kenji Kono</i>	
Content Based SLAs in Cloud Computing Environments .....	977
<i>Nikoletta Mavrogeorgi, Spyridon Gogouvitis, Athanasios Voulodimos, Gregory Katsaros, Stefanos Koutsoutos, Dimosthenis Kiriazis, Theodora Varvarigou, and Elliot K. Kolodner</i>	

## **Work-in-Progress Track 4: Cloud Applications**

Enterprise Architectures for Cloud Computing .....	979
<i>Laura Aureli, Arianna Pierfranceschi, and Holger Wache</i>	
TOSSMA: A Tenant-Oriented SaaS Security Management Architecture .....	981
<i>Mohamed Almorsy, John Grundy, and Amani S. Ibrahim</i>	

A Holistic View of Information Management in Cloud Environments .....	989
<i>Gregory Katsaros, Spyridon Gogouvitis, Nikoletta Mavrogeorgi,</i>	
<i>Athanasios Voulodimos, Dimosthenis Kiriazis, Theodora Varvarigou,</i>	
<i>and Roman Talyansky</i>	
Video Surveillance Based on Cloud Storage .....	991
<i>D.A. Rodríguez-Silva, L. Adkinson-Orellana, F.J. González-Castaño,</i>	
<i>I. Armiño-Franco, and D. González-Martínez</i>	
Quantifying Manageability of Cloud Platforms .....	993
<i>Madhavi Maiya, Sai Dasari, Ravi Yadav, Sandhya Shivaprasad, and Dejan Milojevic</i>	
Managing a Cloud for Multi-agent Systems on Ad-Hoc Networks .....	996
<i>Subhajit Sidhanta and Supratik Mukhopadhyay</i>	

## **Other Papers**

COSBench: A Benchmark Tool for Cloud Object Storage Services .....	998
<i>Qing Zheng, Haopeng Chen, Yaguang Wang, Jiangang Duan, and Zhiteng Huang</i>	
Portable Data Management Cloud for Field Science .....	1000
<i>Yuma Matsui, Aaron Gidding, Thomas E. Levy, Falko Kuester,</i>	
<i>and Thomas A. DeFanti</i>	
Space Reduction for Extreme Aggregation of Data Stream over Time-Based Sliding Window .....	1002
<i>Weilong Ding, Yanbo Han, Jing Wang, and Zhuofeng Zhao</i>	

## **Author Index**