2016 IEEE 9th International Conference on Cloud Computing (CLOUD 2016)

San Francisco, California, USA
27 June – 2 July 2016

Pages 497-993
Message from the General Chairs...........................................................................................................xix
Message from the Program Chairs..........................................................................................................xxi
Organizing Committee.............................................................................................................................xxii
Program Committee.................................................................................................................................xxv
IEEE Computer Society Technical Committee
on Services Computing..........................................................................................................................xxxi

Research Track

Session 1: Cloud Resource Scaling
Empirical Evaluation of Workload Forecasting Techniques for Predictive Cloud Resource Scaling ..........................................................................................................................................1
In Kee Kim, Wei Wang, Yanjun Qi, and Marty Humphrey
Workload and Resource Aware Proactive Auto-scaler for PaaS Cloud ....................................................11
RC3E: Reconfigurable Accelerators in Data Centres and Their Provision by Adapted Service Models ........................................................................................................................................19
Oliver Knodel, Patrick Lehmann, and Rainer G. Spallek

Session 2: Cloud Security I
TAaaS: Trustworthy Authentication as a Service Based on Trusted Path .............................................27
Jisoo Oh, Jaemin Park, Sungjin Park, and Jong-Jin Won
Thwarting Market Specific Attacks in Cloud ..............................................................................................35
Giannis Tziakouris, Rami Bahsoon, Tom Chothia, and Rajkumar Buyya
Secure Offloading of Legacy IDSes Using Remote VM Introspection in Semi-trusted Clouds ......................................................43
  Kenichi Kourai and Kazuki Juda

**Session 3: Cloud Security II**

OpenStack Security Modules: A Least-Invasive Access Control Framework for the Cloud ..........................................................51
  Yang Luo, Wu Luo, Tian Puyang, Qingni Shen, Anbang Ruan, and Zhonghai Wu

End-to-End Security Formalization and Alignment for Federated Workflow Management ...............................................................59
  Matthew Dickinson, Saptarshi Debroy, Prasad Calyam, Samaikya Valluripally, Yuanxun Zhang, Trupti Joshi, and Dong Xu

An Integrated Privacy Preserving Attribute Based Access Control Framework ..........................................................68
  Runhua Xu and James B.D. Joshi

**Session 4: Power Management**

Efficient Peak Shaving in a Data Center by Joint Optimization of Task Assignment and Energy Storage Management ........................................77
  Shuang Chen and Massoud Pedram

Energy Optimal VM Placement in the Cloud ..........................................................................................................................84
  Yi Wang and Ye Xia

Hadoop in Flight: Migrating Live MapReduce Jobs for Power-Shifting Data Centers ........................................................................92
  Chili Johnson and David Chiu

**Session 5: Cloud Stream Processing**

Elastic Stream Processing for the Internet of Things ....................................................................................................................100
  Christoph Hochreiner, Michael Vögler, Stefan Schulte, and Schahram Dustdar

Enabling Elastic Stream Processing in Shared Clusters ..............................................................................................................108
  Jack Li, Calton Pu, Yuan Chen, Daniel Gmach, and Dejan Milojicic

Utilizing Massive Viewers for Video Transcoding in Crowdsourced Live Streaming ........................................................................116
  Qiyun He, Cong Zhang, and Jiangchuan Liu

**Session 6: Best Student Papers**

Fine-Grained Resource Scaling in a Public Cloud: A Tenant's Perspective ..............................................................124
  Cheng Wang, Aayush Gupta, and Bhuvan Urgaonkar

Efficient Real-Time Auditing and Proof of Violation for Cloud Storage Systems ........................................................132
  Gwan-Hwan Hwang and Hung-Fu Chen
Online VNF Scaling in Datacenters .................................................................140
   Xiaoke Wang, Chuan Wu, Franck Le, Alex Liu, Zongpeng Li, and Francis Lau

Session 7: Cloudware
D3W: Towards Self-Management of Distributed Data-Driven Workflows
   with QoS Guarantees ..................................................................................148
   Mengsong Zou, Javier Diaz-Montes, Kiran Nagaraja, Nimish Radia,
   and Manish Parashar
Optimized Durable Commitlog for Apache Cassandra Using CAPI-Flash ..........156
   Bedri Sendir, Madhusudhan Govindaraju, Rei Odaira, and Peter Hofstee
Towards Cloudware Paradigm for Cloud Computing .....................................164
   Dong Guo, Wei Wang, Jingxuan Zhang, Guosun Zeng, Qiao Xiang,
   and Zerong Wei

Session 8: Cloud Modeling
Litigo: A Cost-Driven Model for Opaque Cloud Services ..............................172
   Shahid Al Noor, Rasib Khan, Mahmud Hossain, and Ragib Hasan
Vertigo: Programmable Micro-controllers for Software-Defined Object Storage .........................................................180
   Josep Sampé, Pedro García-López, and Marc Sánchez-Artigas
Stage Aware Performance Modeling of DAG Based in Memory Analytic
   Platforms ....................................................................................................188
   Giovanni Paolo Gibilisco, Min Li, Li Zhang, and Danilo Ardagna

Session 9: Cloud Performance Management I
Experimental Performance Evaluation of Cloud-Based Analytics-as-a-Service ..................................................196
   Francesco Pace, Marco Milanesio, Daniele Venzano, Damiano Carra,
   and Pietro Michiardi
Towards Performance Modeling as a Service by Exploiting Resource Diversity
   in the Public Cloud ....................................................................................204
   Mark Meredith and Bhuvan Urgaonkar

Session 10: Cloud Performance Management II
Towards Deadline Guaranteed Cloud Storage Services ................................212
   Guoxin Liu, Haiying Shen, and Lei Yu
SCoPe: A Decision System for Large Scale Container Provisioning
   Management .............................................................................................220
   Aditya Hegde, Rahul Ghosh, Tridib Mukherjee, and Varun Sharma
QoS Assurance through Low Level Analysis of Resource Utilization of the Cloud Applications .................................................................228

Parisa Heidari and Ali Kanso

Session 11: Data Analytics in Cloud
A Testbed for Collecting QoS Data of Cloud-Based Analytic Services ..........................................................236
Md Shahinur Rahman, Chen Ding, Xumin Liu, and Chi-Hung Chi

KCGS-Store: A Columnar Storage Based on Group Sorting of Key Columns .........................................................244
Tao Xu and Dongsheng Wang

Location-Aware Data Block Allocation Strategy for HDFS-Based Applications in the Cloud ..............................................................252
Hua Xu, Weiqing Liu, Guansheng Shu, and Jing Li

Session 12: Best General Papers
Scalable Transaction Management for Partially Replicated Data in Cloud Computing Environments ............................................................260
Anand Tripathi and Gowtham Rajappan

MIST: Mitigating Host-Side Interference for Storage Traffic in Virtualized Data Centers .................................................................268
Hee Won Lee and Moo-Ryong Ra

Performance Interference of Memory Thrashing in Virtualized Cloud Environments: A Study of Consolidated n-Tier Applications ..........................................................276
Junhee Park, Qingyang Wang, Jack Li, Chien-An Lai, Tao Zhu, and Calton Pu

Session 13: Cloud Testing
Amazon Elastic Compute Cloud (EC2) vs. In-House HPC Platform: A Cost Analysis .................................................................284
Joseph Emeras, Sébastien Varrette, and Pascal Bouvry

An Approach to Pinpointing Bug-Induced Failure in Logs of Open Cloud Platforms .................................................................294
Jia Tong, Li Ying, Tang Hongyan, and Wu Zhonghai

Detecting Incipient Faults in Software Systems: A Compressed Sampling-Based Approach .................................................................303
Salvador DeCelis, Tingshan Huang, Matthew C. Stamm, and Nagarajan Kandasamy
Session 14: Cloud Workflow Management

   Guillaume Rosinosky, Samir Youcef, and François Charoy

Coarse-Grained Information Flow Control on Hybrid Clouds ..................................................319
   Chien-An Lai, Asser N. Tantawi, and Calton Pu

Session 15: Software Engineering Practice in Cloud

Automated Setup of Multi-cloud Environments for Microservices Applications .........................327
   Gustavo Sousa, Walter Rudametkin, and Laurence Duchien

Model-Driven Application Refactoring to Minimize Deployment Costs in Preemptible Cloud Resources ..................................................................................335
   Daniel J. Dubois, Catia Trubiani, and Giuliano Casale

iGen: A Realistic Request Generator for Cloud File Systems Benchmarking .........................................343
   Zujie Ren, Biao Xu, Weisong Shi, Yongjian Ren, Feng Cao, Jiangbin Lin, and Zheng Ye

Session 16: Cloud Applications

Migrating GIS Big Data Computing from Hadoop to Spark: An Exemplary Study Using Twitter ........................................................................................................351
   Zhibo Sun, Hong Zhang, Zixia Liu, Chen Xu, and Liqiang Wang

Security, Compliance, and Agile Deployment of Personal Identifiable Information Solutions on a Public Cloud ..........................................................................................359
   Yasuharu Katsuno, Ashish Kundu, Koushik K. Das, Hitomi Takahashi, Robert Schloss, Prasenjit Dey, and Mukesh Mohania

Towards Application-centric Fairness in Multi-tenant Clouds with Adaptive CPU Sharing Model ...........................................................................................................367
   Anthony O. Ayodele, Jia Rao, and Terrance E. Boult

Session 17: Data Sharing

VNF Placement and Chaining in Distributed Cloud ........................................................................376
   Marouen Mechtri, Chaima Ghribi, and Djamal Zeghlache

A Utility-Aware Approach to Redundant Data Upload in Cooperative Mobile Cloud .................................................................384
   Ji Wang, Xiaomin Zhu, Weidong Bao, and Ling Liu

Understanding Data Sharing in Private Personal Clouds ................................................................392
   Raúl Gracia-Tinedo, Pedro García-López, Alberto Gómez, and Anastasio Illana
Applications Track

Session 1: Cloud Application Programming
Cloud Event Programming Paradigms: Applications and Analysis .........................................................400
Garrett McGrath, Jared Short, Stephen Ennis, Brenden Judson, and Paul Brenner
An Approach for Evaluating Cloud Application Topologies Based on TOSCA ..............................................407
Americo Sampaio, Tiago Rolim, Nabor C. Mendonça, and Matheus Cunha
rSLA: A Service Level Agreement Language for Cloud Services .................................................................415
Samir Tata, Mohamed Mohamed, Takashi Sakairi, Nagapramod Mandagere, Obinna Anya, and Heiko Ludwig

Session 2: Resilience
Modeling Interference for Apache Spark Jobs ..................................................................................................423
Kewen Wang, Mohammad Maifi Hasan Khan, Nhan Nguyen, and Swapna Gokhale
Disaster Recovery for Cloud-Hosted Enterprise Applications ...........................................................................432
Long Wang, Richard E. Harper, Ruchi Mahindru, and Harigovind V. Ramasamy
A Test Design Method for Resilient System on Cloud Infrastructure ............................................................440
Masaya Fujiwaka, Fumio Machida, and Seiichi Koizumi

Session 3: Scalability
PaceMaker: When ZooKeeper Arteries Get Clogged in Storm Clusters ...........................................................448
Sanket Chintapalli, Derek Dagit, Robert Evans, Reza Farivar, Zhuo Liu, Kyle Nusbaum, Kishorkumar Patil, and Boyang Peng
Performance Measurement on Scale-Up and Scale-Out Hadoop with Remote and Local File Systems ..................456
Zhuozhao Li and Haiying Shen
An Economic Model for Scaling Cloud Applications .........................................................................................464
Marios Fokaefs, Cornel Barna, and Marin Litoiu

Session 4: Cloud Software Management
CSMiner: An Automated Tool for Analyzing Changes in Configuration Settings across Multiple Versions of Large Scale Cloud Software .........................................................................................472
Han Nguyen, Mohammad Maifi Hasan Khan, and Kewen Wang
Streamlining Management of Multiple Cloud Services .....................................................................................481
Aditi Gupta, Sudip Mittal, Karuna P. Joshi, Claudia Pearce, and Anupam Joshi
Towards Cloud-Aware Policy Enforcement with Universal Cloud Classification as a Service (UCCaaS) in Software Defined Networks ......................................................................................489
Sebastian Jeuk, Gonzalo Salgueiro, and Shi Zhou
Session 5: Cloud Infrastructure Management
Rolling Upgrade with Dynamic Batch Size for IaaS Cloud .................................................................497
  Mina Nabi, Maria Toeroe, and Ferhat Khendek
Breaking Down the Monarchy: Achieving Trustworthy and Open Cloud
Ecosystem Governance with Separation-of-Powers ..............................................................505
  Anbang Ruan, Ming Wei, Andrew Martin, David Blundell, and David Wallom
PiBooster: Performance Accelerations in Page Table Management
for Paravirtual VMs ..........................................................................................................................513
  Zhi Zhang and Yueqiang Cheng

Session 6: Performance
Acacia-RDF: An X10-Based Scalable Distributed RDF Graph Database
Engine ..............................................................................................................................................521
  Miyuru Dayarathna, Isuru Herath, Yasima Dewmini, Gayan Mettananda,
  Sameera Nandasiri, Sanath Jayasena, and Toyotaro Suzumura
Comparisons of Heat Map and IFL Technique to Evaluate the Performance
of Commercially Available Cloud Providers ..................................................................................529
  Shyam S. Wagle, Mateusz Guzek, Pascal Bouvry, and Raymond Bisdorff
Exploring the Design Space for Optimizations with Apache Aurora and Mesos .......................537
  Renan DelValle, Gourav Rattihalli, Angel Beltre, Madhusudhan Govindaraju,
  and Michael J. Lewis

Session 7: Resource Management
Auto-tuning Performance of MPI Parallel Programs Using Resource
Management in Container-Based Virtual Cloud ............................................................................545
  Hongyi Ma, Liqiang Wang, Byung Chul Tak, Long Wang, and Chunqiang Tang
Self-Adaptive Resource Management System in IaaS Clouds ......................................................553
  Fahimeh Farahnakian, Rami Bahsoon, Pasi Liljeberg, and Tapio Pahikkala
Resource Management for Elastic Publish Subscribe Systems: A Performance
Modeling-Based Approach ..............................................................................................................561
  Phuong Nguyen and Klara Nahrstedt

Session 8: Cloud Resources
Short Run: Heuristic Approaches for Cloud Resource Selection ......................................................569
  Ronny Hans, David Steffen, Ulrich Lampe, Dominik Stingl, and Ralf Steinmetz
Uncertainty-Aware Real-Time Workflow Scheduling in the Cloud ..................................................577
  Huangke Chen, Xiaomin Zhu, Dishan Qiu, and Ling Liu
A Semantic Framework Supporting Cloud Resource Descriptions Interoperability .................................................................585

Karn Yongsiriwit, Mohamed Sellami, and Walid Gaaloul

Session 9: Cloud Privacy and Trust

Practical Privacy-Preserving Medical Diagnosis Using Homomorphic Encryption .................................................................................................................................593

Sergiu Carpov, Thanh Hai Nguyen, Renaud Sirdey, Gianpiero Constantino, and Fabio Martinelli

Tenants Attested Trusted Cloud Service .................................................................600

Jiangchun Ren, Ling Liu, Da Zhang, Qi Zhang, and Haihe Ba

Consumer Oriented Privacy Preserving Access Control for Electronic Health Records in the Cloud .................................................................608

Ruchith Fernando, Rohit Ranchal, Byungchan An, Lotfi Ben Othman, and Bharat Bhargava

Session 10: Cloud Security Monitoring

Anomaly Detection in the Cloud Using Data Density .................................................................616

Syed Noorulhassan Shirazi, Steven Simpson, Antonios Gouglidis, Andreas Mauthe, and David Hutchison

Reputation Audit in Multi-cloud Storage through Integrity Verification and Data Dynamics .................................................................................................................................624

Xin Tang, Yining Qi, and Yongfeng Huang

A Streaming Intrusion Monitoring and Classification System for IaaS Cloud .................................................................632

Jason Nikolai and Yong Wang

Session 11: Energy Modeling

A Profit Optimization Framework of Energy Storage Devices in Data Centers: Hierarchical Structure and Hybrid Types .........................................................................................................................640

Xue Lin, Massoud Pedram, Jian Tang, and Yanzhi Wang

Accuracy of Energy Model Calibration with IPMI .................................................................................................................................648

Richard Kavanagh, Django Armstrong, and Karim Djemame

Application of Convolutional Neural Network to Prediction of Temperature Distribution in Data Centers .................................................................................................................................656

Shinya Tashiro, Yutaka Nakamura, Kazuhiro Matsuda, and Morito Matsuoka
Session 12: Cloud Data Storage

LAST-HDFS: Location-Aware Storage Technique for Hadoop Distributed File System .................................................................................................................................................................................................662
   Cong Liao, Anna Squicciarini, and Dan Lin
Uploading and Replicating Internet of Things (IoT) Data on Distributed Cloud Storage .................................................................................................................................................................................................................................................................670
   Akshay Kumar, Nanjangud C. Narendra, and Umesh Bellur
Improving Cloud-Based Online Social Network Data Placement and Replication .................................................................................................................................................................................................................................................................678
   Hourieh Khalajzadeh, Dong Yuan, John Grundy, and Yun Yang

Session 13: Delay Optimization

CRED: Cloud Right-Sizing to Meet Execution Deadlines and Data Locality ............................................686
   Sultan Alamro, Maotong Xu, Tian Lan, and Suresh Subramaniam
Eliminating OS-Caused Large JVM Pauses for Latency-Sensitive Java-Based Cloud Platforms .................................................................................................................................................................................................................................................................694
   Zhenyun Zhuang, Cuong Tran, Haricharan Ramachandra, and Badri Sridharan
Inter-player Delay Optimization in Multiplayer Cloud Gaming ..................................................................702
   Yuchi Chen, Jiangchuan Liu, and Yong Cui

Session 14: VM/Container Management

A Novel Multi-objective Optimization Scheme for Rebalancing Virtual Machine Placement ........................................................710
   Rui Li, Qinghua Zheng, Xiuqi Li, and Jie Wu
Model-Driven Management of Docker Containers ......................................................................................718
   Fawaz Paraiso, Stéphanie Challita, Yahya Al-Dhuraibi, and Philippe Merle
Tree Packing for Elastic Machine Allocation in RaaS Cloud ..........................................................................726
   Li Li, Min Luo, and Wu Chou

Session 15: Scheduling Algorithms

A Novel Scheduling Mechanism For Hybrid Cloud Systems .........................................................................734
   Haoran Wei and Fanchao Meng
Optimizing Schedule for Parallel Software Deployments Based on Profiles of Network Activity and Installation Time in Cloud Environments ........................................................................742
   Hitomi Takahashi and Yasuharu Katsuno
SLA-Driven VM Scheduling in Mobile Edge Computing ............................................................................750
   Kostas Katsalis, Thanasis G. Papaioannou, Navid Nikaein, and Leandros Tassiulas
Session 16: Novel Cloud Applications

Container Based Video Surveillance Cloud Service with Fine-Grained Resource Provisioning ................................................................. 758
   Haitao Zhang, Huadong Ma, Guangping Fu, Xianda Yang, Zhe Jiang,
   and Yangyang Gao

MlaaS: Medical Image Archival and Analytics as-a-Service ........................................... 766
   Han Ter Jung, Ku Hwan An, Jin Cheul Park, Soo Dong Kim, and Hyun Jung La

Reproducible Scientific Computing Environment with Overlay Cloud Architecture ................................................................. 774
   Shigetoshi Yokoyama, Yoshinobu Masatani, Tazro Ohta, Osamu Ogasawara,
   Nobukazu Yoshioka, Kai Liu, and Kento Aida

Session 17: Cloud Infrastructure

SDN-Based Framework for Infrastructure as a Service Clouds ............................................. 782
   Heli Amarasinghe and Ahmed Karmouch

Optimizing Backup Resources in the Cloud ........................................................................... 790
   Xinyi Li, Yong Qi, Pengfei Chen, and Xiaohui Zhang

Short Paper Track

Session 1: Cloud as a Service

Traffic-Aware Virtual Machine Migration Scheduling Problem in Geographically Distributed Data Centers ................................................. 798
   Hana Teyeb, Ali Balma, Samir Tata, and Nejib Ben HadJ-Alouane

Fast Resource Co-provisioning for Time Critical Applications Based on Networked Infrastructures .................................................. 802
   Huan Zhou, Junchao Wang, Yang Hu, Jinshu Su, Paul Martin, Cees De Laat,
   and Zhiming Zhao

Jugo: A Generic Architecture for Composite Cloud as a Service ........................................ 806
   Mahmud Hossain, Rasib Khan, Shahid Al Noor, and Ragib Hasan

Gnafuy: A Framework for Ubiquitous Mobile Computation ........................................... 810
   Jin-Jie Chen and Fang Yu

A Self-Evolving Method of Data Model for Cloud-Based Machine Data Ingestion ......................... 814
   Cun Ji, Shijun Liu, Chenglei Yang, Lizhen Cui, Li Pan, Lei Wu, and Yingbo Liu
Session 2: Cloud Infrastructure

A Black-Box Self-Learning Scheduler for Cloud Block Storage Systems ..................................................820
Babak Ravandi, Ioannis Papapanagiotou, and Baijian Yang

Distributed Shared Memory Based Live VM Migration ..................................................................................826
Tariq Daradkeh and Anjali Agarwal

Automated Demand-Based Vertical Elasticity for Heterogeneous Real-Time Workloads ...............................831
Geoffrey Phi C. Tran, Yu-An Chen, Dong-In Kang, John Paul Walters, and Stephen P. Crago

Storage Benchmarking for Workload Aware Storage Platform ........................................................................835
Wubin Li and Benoit Tremblay

Multi-code Distributed Storage ......................................................................................................................839
Cornelius Hellge and Muriel Medard

Session 3: Cloud Management and Operations I

Test-Based Cloud Service Certification of Opportunistic Providers ..............................................................843
Philipp Stephanow, Gaurav Srivastava, and Julian Schütte

Demonstrating Scalability and Efficiency of Pack-centric Resource Management for Cloud ........................849
Yi Wang, Ye Xia, Shigang Chen, Mauricio Tsugawa, and Jose A.B. Fortes

Managing QoS Constraints in a P2P-Cloud Video on Demand System .......................................................855
Elias De O. Granja, Luiz F. Bittencourt, Ioan Petri, Omer F. Rana, and César A.V. Melo

Try Managing Your Deduplication Fine-Grained-ly: A Multi-tiered and Dynamic SLA-Driven Deduplication Framework for Primary Storage .................................................................859
Yan Tang, Jianwei Yin, and Zhaohui Wu

Systemic Risks in the Cloud Computing Model: Complex Systems Perspective .............................................863
V. Marbukh

Session 4: Cloud Management and Operations II

On-Demand Bandwidth Pricing for Congestion Control in Core Switches in Cloud Networks ..........................867
Abouzar Ghavami, Zhuozhao Li, and Haiying Shen

Dynamic Modelling of Tactics Impact on the Stability of Self-Aware Cloud Architectures .............................871
Maria Salama, Ahmed Shawish, and Rami Bahsoon
Integrating Clustering and Learning for Improved Workload Prediction in the Cloud ..........................................................876
  Yongjia Yu, Vasu Jindal, I-Ling Yen, and Farokh Bastani
A Reliable Cloud-Based Feedback Control System ..........................................................880
  Yu Kaneko and Toshio Ito
Toward Real-Time and Fine-Grained Monitoring of Software-Defined Networking in the Cloud ..........................................................884
  Dongfang Zhao

Session 5: Cloud Security
P-Cop: A Cloud Administration Proxy to Enforce Bipartite Maintenance of PaaS Services ..........................................................888
  Bruno Braga and Nuno Santos
Improved Lightweight Proxy Re-encryption for Flexible and Scalable Mobile Revocation Management in Cloud Computing ..........................................................894
  Somchart Fugkeaw and Hiroyuki Sato
SECAP: Towards Securing Application Provenance in the Cloud ..........................................................900
  Shams Zawoad and Ragib Hasan
The End of Effective Law Enforcement in the Cloud? - To Encrypt, or Not to Encrypt ..........................................................904
  Steven Ryder and Nhien-An Le-Khac
COR-Honeypot: Copy-On-Risk, Virtual Machine as Honeypot in the Cloud ..........................................................908
  Denis Lavrov, Veronique Blanchet, Shaoning Pang, Muyang He,
  and Abdolhossein Sarrafzadeh

Session 6: Performance, Scalability, and Reliability
Performance, Resource, and Cost Aware Resource Provisioning in the Cloud ..........................................................913
  Lajanugen Logeswaran, H.M.N. Dilum Bandara, and H.S. Bhathiya
TaskInsight: A Fine-Grained Performance Anomaly Detection and Problem Locating System ..........................................................917
  Xiao Zhang, Fanjing Meng, Pengfei Chen, and Jingmin Xu
On Service Level Agreement Assurance in Cloud Computing Data Centers ..........................................................921
  Abdallah Ali Zainelabden, A. Ibrahim, Dzmitry Kliazovich, and Pascal Bouvry
Dynamic Deployment and Auto-scaling Enterprise Applications on the Heterogeneous Cloud ..........................................................927
  Satish Narayana Srirama, Tverezovskiy Iurii, and Jaagup Viil
Session 7: Cloud Applications I

Improving Coding Performance and Energy Efficiency of Erasure Coding
Process for Storage Systems - A Parallel and Scalable Approach ................................................................. 933
   Hsing-Bung Chen and Song Fu

TrustyDrive, a Multi-cloud Storage Service That Protects Your Privacy ................................................................. 937
   Remy Pottier and Jean-Marc Menaud

Protect Both Integrity and Confidentiality in Outsourcing Collaborative Filtering
Computations .......................................................................................................................................................... 941
   Qiang Tang, Balázs Pejó, and Husen Wang

Resource Allocation Algorithms for Multicast Streaming in Elastic Cloud-Based Media Collaboration Services ................................................................................................................................. 947
   Rafael Xavier, Hendrik Moens, Bruno Volckaert, and Filip De Turck

Bidimensional Cross-Cloud Management with TOSCA and Brooklyn ................................................................. 951
   Jose Carrasco, Javier Cubo, Francisco Durán, and Ernesto Pimentel

Session 8: Cloud Applications II

Performance Analysis of a Multi-tenant In-Memory Data Grid .................................................................................. 956
   Anwesha Das, Frank Mueller, Xiaohui Gu, and Arun Iyengar

A Dynamic Programming Offloading Algorithm Using Biased Randomization ......................................................... 960
   Haleh Shahzad and Ted H. Szymanski

An SLA and Operation Cost Aware Performance Re-tuning Algorithm for Cloud Databases ........................................ 966
   Liangzhe Li and Le Gruenwald

Efficient Processing of Encrypted Data in Honest-but-Curious Clouds ...................................................................... 970
   Dongxi Liu

Session 9: Cloud Management and Operations III

CloudMeasure: A Platform for Performance Analysis of Cloud Computing Systems .................................................................................................................................................................................. 975
   Luis Eduardo Bautista Villalpando, Alain April, and Alain Abran

MemNet: Enhancing Throughput and Energy Efficiency for Hybrid Workloads via Para-virtualized Memory Sharing ................................................................................................................................................. 980
   Chi Xu, Xiaoliang Ma, Ryan Shea, Haiyang Wang, and Jiangchuan Liu

SMPA: An Energy-Aware Service Migration Strategy in Cloud Networks ................................................................. 984
   Bing Yu, Yanni Han, Xuemin Wen, and Zhen Xu

Managing Cloud Storage Obliviously ......................................................................................................................... 990
   Vaishali Narkhede, Karuna Joshi, Adam J. Aviv, Seung Geol Choi, Daniel S. Roche, and Tim Finin
Author Index