

2015 IEEE 23rd International Symposium on Modeling, Analysis and Simulation of Computer and Telecommunication Systems (MASCOTS 2015)

**Atlanta, Georgia, USA
5 – 7 October 2015**



**IEEE Catalog Number: CFP15010-POD
ISBN: 978-1-4673-7721-8**

IEEE 23rd International Symposium on Modeling, Analysis, and Simulation of Computer and Telecommunication Systems

MASCOTS 2015

Table of Contents

Message from the General and Program

Chairs.....ix

Organizing Committee.....x

Reviewers.....xii

Networking

TARS: A Traffic-Adaptive Receiver-Synchronized MAC Protocol
for Underwater Sensor Networks1

Yu Han and Yunsu Fei

A Graph Theoretical Analysis of the Web Using DNS Traffic Traces11

Sean Sanders and Jasleen Kaur

evalBox: A Cross-Platform Evaluation Framework for Network Systems15

Vineet Sinha and Mea Wang

On the Fidelity of Single-Machine Network Emulation in Linux19

Joseph D. Beshay, Andrea Francini, and Ravi Prakash

Memory I

Alleviating DRAM Refresh Overhead Via Inter-rank Piggyback Caching23

Yuhua Guo, Ping Huang, Benjamin Young, Tao Lu, Xubin He, and Qing Gary Liu

Characterizing the Overhead of Software-Managed Hybrid Main Memory33

Santiago Bock, Bruce R. Childers, Rami Melhem, and Daniel Mossé

FAME: A Fast and Accurate Memory Emulator for New Memory System Architecture Exploration	43
<i>Krishna T. Malladi, Mu-Tien Chang, John Ping, and Hongzhong Zheng</i>	
Flash-Aware High-Performance and Endurable Cache	47
<i>Qianbin Xia and Weijun Xiao</i>	

Cloud I

On Fair Attribution of Costs under Peak-Based Pricing to Cloud Tenants	51
<i>Neda Nasiriani, Cheng Wang, George Kesidis, Bhuvan Urgaonkar, Lydia Y. Chen, and Robert Birke</i>	
Reducing Job Slowdown Variability for Data-Intensive Workloads	61
<i>Bogdan Ghit and Dick Epema</i>	
On Biasing towards Optimized Application Placement in the Cloud	71
<i>Asser N. Tantawi</i>	

Architectures

Energy Efficiency of Hierarchical Server Load Distribution Strategies	75
<i>Jóakim von Kistowski, John Beckett, Klaus-Dieter Lange, Hansfried Block, Jeremy A. Arnold, and Samuel Kounev</i>	
An Approach to Discrete Parameter Design Space Exploration of Multi-core Systems Using a Novel Simulation Based Interpolation Technique	85
<i>Neha V. Karanjkar and Madhav P. Desai</i>	
To Co-run, or Not to Co-run: A Performance Study on Integrated Architectures	89
<i>Feng Zhang, Jidong Zhai, Wenguang Chen, Bingsheng He, and Shuhao Zhang</i>	

Memory II

Characterization of Dynamic Memory Allocations in Real-World Applications: An Experimental Study	93
<i>Diego Costa and Rivalino Matias Jr.</i>	
I/O-Cache: A Non-volatile Memory Based Buffer Cache Policy to Improve Storage Performance	102
<i>Ziqi Fan, Alireza Haghdooost, David H.C. Du, and Doug Voigt</i>	
AYUSH: Extending Lifetime of SRAM-NVM Way-Based Hybrid Caches Using Wear-Leveling	112
<i>Sparsh Mittal and Jeffrey S. Vetter</i>	
InterSense: Interconnect Performance Emulator for Future Scale-out Distributed Memory Applications	122
<i>Qi Wang, Ludmila Cherkasova, Jun Li, and Haris Volos</i>	

Modeling and Workloads

Perfect Sampling in Stochastic Petri Nets Using Decision Diagrams	126
<i>Simonetta Balsamo, Andrea Marin, and Ivan Stojic</i>	
A Product-Form Model for the Analysis of Systems with Aging Objects	136
<i>Filippo Cavallin, Andrea Marin, and Sabina Rossi</i>	
A Case for Rigorous Workload Classification	146
<i>Avani Wildani and Ian F. Adams</i>	
Accelerating Graphics in the Simics Full-System Simulator	150
<i>Eric Nilsson, Daniel Aarno, Erik Carstensen, and Håkan Grahm</i>	

Cloud II

Self-Boosted Co-scheduling for SMP Virtual Machines	154
<i>Kun Wang, Yudi Wei, Cheng-Zhong Xu, and Jia Rao</i>	
CloudScope: Diagnosing and Managing Performance Interference in Multi-tenant Clouds	164
<i>Xi Chen, Lukas Rupperecht, Rasha Osman, Peter Pietzuch, Felipe Franciosi, and William Knottenbelt</i>	
MRemu: An Emulation-Based Framework for Datacenter Network Experimentation Using Realistic MapReduce Traffic	174
<i>Marcelo Veiga Neves, Cesar A.F. De Rose, and Kostas Katrinis</i>	

Mobile and Social

On Modeling and Impact of Geographic Restrictions for Human Mobility in Opportunistic Networks	178
<i>Matthias Schwamborn and Nils Aschenbruck</i>	
CPSys: A System for Mobile Video Prefetching	188
<i>Ali Gouta, David Hausheer, Anne-Marie Kermarrec, Christian Koch, Yannick Lelouedec, and Julius Rückert</i>	

Storage Systems

Preserving Row Buffer Locality for PCM Wear-Leveling under Massive Parallelism	198
<i>Xinning Wang, Bin Wang, Zhuo Liu, and Weikuan Yu</i>	
Soothsayer: Predicting Capacity Usage in Backup Storage Systems	208
<i>Christy Vaughn, Caleb Miller, Onyebuchi Ekenta, Hongtao Sun, Medha Bhadkamkar, Petros Efstathopoulos, and Erim Kardes</i>	

ExaPlan: Queueing-Based Data Placement and Provisioning for Large Tiered Storage Systems	218
<i>Ilias Iliadis, Jens Jelitto, Yusik Kim, Slavisa Sarafijanovic, and Vinodh Venkatesan</i>	
SMR Disks for Mass Storage Systems	228
<i>Quoc Minh Le, Ahmed Amer, and JoAnne Holliday</i>	
 Cloud III	
BATS: Budget-Constrained Autoscaling for Cloud Performance Optimization	232
<i>A. Hasan Mahmud, Yuxiong He, and Shaolei Ren</i>	
HALO: Heterogeneity-Aware Load Balancing	242
<i>Anshul Gandhi, Xi Zhang, and Naman Mittal</i>	
Using Application Data for SLA-Aware Auto-scaling in Cloud Environments	252
<i>Andre Abrantes D.P. Souza and Marco A.S. Netto</i>	
 Author Index	 256