2018 IEEE 26th International Symposium on Modeling, Analysis, and Simulation of Computer and Telecommunication Systems (MASCOTS 2018)

Milwaukee, Wisconsin, USA 25 – 28 September 2018



IEEE Catalog Number: ISBN:

onber: CFP18010-POD 978-1-5386-6887-0

Copyright \odot 2018 by the Institute of Electrical and Electronics Engineers, Inc. All Rights Reserved

Copyright and Reprint Permissions: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

*** This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.

 IEEE Catalog Number:
 CFP18010-POD

 ISBN (Print-On-Demand):
 978-1-5386-6887-0

 ISBN (Online):
 978-1-5386-6886-3

ISSN: 1526-7539

Additional Copies of This Publication Are Available From:

Curran Associates, Inc 57 Morehouse Lane Red Hook, NY 12571 USA Phone: (845) 758-0400

Fax: (845) 758-2633

E-mail: curran@proceedings.com Web: www.proceedings.com



2018 IEEE International Symposium on the Modeling, Analysis, and Simulation of Computer and Telecommunication Systems MASCOTS 2018

Table of Contents

Message from the General Chair x
Committees xi.
Program Committee xii
Additional Reviewers xiv
Storage I
Content Popularity-Based Selective Replication for Read Redirection in SSDs .1. Nima Elyasi (The Pennsylvania State University), Mohammad Arjomand (Georgia Institute of Technology), Anand Sivasubramaniam (The Pennsylvania State University), Mahmut T. Kandemir (The Pennsylvania State University), and Chita R. Das (The Pennsylvania State University)
Freezing Time: A New Approach for Emulating Fast Storage Devices Using VM .16. Luis C. E. Bona (Federal University of Paraná), Alessandro Elias (Federal University of Parana), Andre P. Ziviani (Federal University of Paraná), Toni Cortes (Universitat Politècnica de Catalunya), Ramon Nou (Universitat Politècnica de Catalunya), and Marco A. Z. Alves (Federal University of Paraná)
Using Simulation to Design Scalable and Cost-Efficient Archival Storage Systems .25. James Byron (University of California Santa Cruz), Darrell D. E. Long (University of California Santa Cruz), and Ethan L. Miller (University of California Santa Cruz, Pure Storage)
Storage II
FSTL: A Framework to Design and Explore Shingled Magnetic Recording Translation Layers .40

(Pennsylvania State University), and Chita Das (Pennsylvania State University)
Efficient Reconstruction Techniques for Disaster Recovery in Secret-Split Datastores .66. Sinjoni Mukhopadhyay (UC Santa Cruz), Joel Frank (Cat Digital Labs), Justin King (Michigan Technological University), Daniel Bittman (UC Santa Cruz), Darrell Long (UC Santa Cruz), and Ethan Miller (UC Santa Cruz)
CachedGC: Cache-Assisted Garbage Collection in Modern Solid State Drives .79
A Robust Fault-Tolerant and Scalable Cluster-Wide Deduplication for Shared-Nothing Storage Systems .87 Awais Khan (Sogang University), Chang-Gyu Lee (Sogang University), Prince Hamandawana (Ajou University), Sungyong Park (Sogang University), and Youngjae Kim (Sogang University)
ChewAnalyzer: Workload-Aware Data Management Across Differentiated Storage Pools .94
Distributed Systems I
cheduling Distributed Resources in Heterogeneous Private Clouds 102
George Kesidis (Pennsylvania State University), Yuquan Shan (Pennsylvania State University), Aman Jain (Pennsylvania State University), Bhuvan Urgaonkar (Pennsylvania State University), Jalal Khamse-Ashari (Carleton University), and Ioannis Lambadaris (Carleton
George Kesidis (Pennsylvania State University), Yuquan Shan (Pennsylvania State University), Aman Jain (Pennsylvania State University), Bhuvan Urgaonkar (Pennsylvania State University), Jalal Khamse-Ashari (Carleton University), and Ioannis Lambadaris (Carleton University) MIRA: Proactive Music Video Caching Using ConvNet-Based Classification and Multivariate Popularity Prediction 109

Systems I

Quantifying and Optimizing Data Access Parallelism on Manycores Jihyun Ryoo (Pennsylvania State University), Orhan Kislal (Pennsylvania State University), Xulong Tang (Pennsylvania State University), and Mahmut T. Kandemir (Pennsylvania State University)	. 131
Entropy-Aware I/O Pipelining for Large-Scale Deep Learning on HPC Systems Yue Zhu (Florida State University), Fahim Chowdhury (Florida State University), Huansong Fu (Florida State University), Adam Moody (Lawrence Livermore National Laboratory), Kathryn Mohror (Lawrence Livermore National Laboratory), Kento Sato (Lawrence Livermore National Laboratory), and Weikuan Yu (Florida State University)	. 145
HPnGs go Non-Linear: Statistical Dependability Evaluation of Battery-Powered Systems Carina Pilch (Westfälische Wilhelms-Universität Münster), Mathis Niehage (Westfälische Wilhelms-Universität Münster), and Anne Remke (Westfälische Wilhelms-Universität Münster)	157
Networking I	
Modeling, Analysis, and Characterization of Periodic Traffic on a Campus Edge Network	. 170
GPU Based Real-Time Super Hosts Detection at Distributed Edge Routers Jie Xu (Southeast University), Wei Ding (Southeast University), Xiaoyan Hu (Southeast University), and Shaobo Sun (Southeast University)	
JoiNS: Meeting Latency SLO with Integrated Control for Networked Storage Hao Wen (University of Minnesota, Twin Cities), Zhichao Cao (University of Minnesota, Twin Cities), Yang Zhang (University of Minnesota, Twin Cities), Xiang Cao (Grand Valley State University), Ziqi Fan (University of Minnesota, Twin Cities), Doug Voigt (Hewlett Packard Enterprise), and David Du (University of Minnesota, Twin Cities)	. 194
Interference and Blockage Prediction in mmWave-Enabled HetNets	. 201
Performance Evaluation I	
SlimCache: Exploiting Data Compression Opportunities in Flash-Based Key-Value Caching	209
TeaStore: A Micro-Service Reference Application for Benchmarking, Modeling and Resource Management Research Jóakim von Kistowski (University of Würzburg), Simon Eismann (University of Würzburg), Norbert Schmitt (University of Würzburg), André Bauer (University of Würzburg), Johannes Grohmann (University of Würzburg), and Samuel Kouney (University of Würzburg)	. 223

Improving Performances of Log Mining for Anomaly Prediction Through NLP-Based Log Parsing .237 Nicolas Aussel (Zodiac Inflight Innovations / SAMOVAR, Télécom SudParis, CNRS, Université Paris-Saclay), Yohan Petetin (SAMOVAR, Télécom SudParis, CNRS, Université Paris-Saclay), and Sophie Chabridon (SAMOVAR, Télécom SudParis, CNRS, Université Paris-Saclay)
Prometheus: Coherent Exploration of Hardware and Software Optimizations Using Aspen .244
Best Paper Candidates
Network Cache Design Under Stationary Requests: Exact Analysis and Poisson Approximation .251
Performance Benchmarking and Optimizing Hyperledger Fabric Blockchain Platform .264
Elevating Commodity Storage with the SALSA Host Translation Layer 277. Nikolas Ioannou (IBM Research), Kornilios Kourtis (IBM Research), and Ioannis Koltsidas (IBM Research)
Distributed Systems II
Pacaca: Mining Object Correlations and Parallelism for Enhancing User Experience with Cloud Storage .293. Binbing Hou (Louisiana State University) and Feng Chen (Louisiana State University)
A Model-Based Approach to Streamlining Distributed Training for Asynchronous SGD .306
Clustering for Load Balancing and Energy Efficiency in IoT Applications .3.19. Shesha Sreenivasamurthy (UCSC) and Katia Obraczka (UCSC)
Performance II
Evaluating Scalability Bottlenecks by Workload Extrapolation 333
Moving Horizon Estimation of Service Demands in Queuing Networks .348. Emilio Incerto (IMT School for Advanced Studies), Annalisa Napolitano (IMT School for Advanced Studies), and Mirco Tribastone (IMT School for Advanced Studies)
An Evaluation of Asynchronous Software Events on Modern Hardware .355. Kyle Hale (Illinois Institute of Technology) and Peter Dinda (Northwestern University)

Overcoming Virtualization Overheads for Large-vCPU Virtual Machines .369
Ozgur Kilic (Bighamton University), Spoorti Doddamani (Binghamton
University), Aprameya Bhat (Binghamton University), Hardik Bagdi
(Binghamton University), and Kartik Gopalan (Binghamton University)
Author Index 381
Allinor index 381