

2016 IEEE 35th Symposium on Reliable Distributed Systems (SRDS 2016)

**Budapest, Hungary
26-29 September 2016**



IEEE Catalog Number: CFP16059-POD
ISBN: 978-1-5090-3514-4

**Copyright © 2016 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 publication is a representation of what appears in the IEEE Digital Libraries. Some format issues inherent in the e-media version may also appear in this print version.***

IEEE Catalog Number:	CFP16059-POD
ISBN (Print-On-Demand):	978-1-5090-3514-4
ISBN (Online):	978-1-5090-3513-7
ISSN:	1080-9857

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

CURRAN ASSOCIATES INC.
proceedings
.com

2016 IEEE 35th Symposium on Reliable Distributed Systems

SRDS 2016

Table of Contents

Message from the General Co-Chairs.....	ix
Message from the Technical Program	
Co-Chairs.....	x
Symposium Organizers.....	xi
Technical Program Committee.....	xii
External Reviewers.....	xiii

Security

The Rowhammer Attack Injection Methodology	1
<i>Keun Soo Yim</i>	
Sharelff: A Sticky Policy Middleware for Self-Destructing Messages in Android Applications	11
<i>António Goulão, Nuno O. Duarte, and Nuno Santos</i>	
Lateral Movement Detection Using Distributed Data Fusion	21
<i>Ahmed Fawaz, Atul Bohara, Carmen Cheh, and William H. Sanders</i>	
Multi-round Master-Worker Computing: A Repeated Game Approach	31
<i>Antonio Fernández Anta, Chryssis Georgiou, Miguel A. Mosteiro, and Daniel Pareja</i>	

Failure Prediction and Detection

Sirius: Neural Network Based Probabilistic Assertions for Detecting Silent Data Corruption in Parallel Programs	41
<i>Tara E. Thomas, Anmol J. Bhattad, Subrata Mitra, and Saurabh Bagchi</i>	
CRUDE: Combining Resource Usage Data and Error Logs for Accurate Error Detection in Large-Scale Distributed Systems	51
<i>Nentawe Gurumdimma, Arshad Jhumka, Maria Liakata, Edward Chuah, and James Browne</i>	

Achieving High Reliability via Expediting the Repair of Critical Blocks in Replicated Storage Systems	61
<i>Juntao Fang, Shenggang Wan, Ping Huang, Xubing He, and Changsheng Xie</i>	
Being Accurate Is Not Enough: New Metrics for Disk Failure Prediction	71
<i>Jing Li, Rebecca J. Stones, Gang Wang, Zhongwei Li, Xiaoguang Liu, and Kang Xiao</i>	

Cloud Computing

Norton Zone: Symantec's Secure Cloud Storage System	81
<i>Walter Bogorad, Scott Schneider, and Haibin Zhang</i>	
Tale of Tails: Anomaly Avoidance in Data Centers	91
<i>Ji Xue, Robert Birke, Lydia Y. Chen, and Evgenia Smirni</i>	
vMocity: Traveling VMs Across Heterogeneous Clouds	101
<i>Cheng Cheng, Zhui Deng, Zhongshu Gu, and Dongyan Xu</i>	
Storekeeper: A Security-Enhanced Cloud Storage Aggregation Service	111
<i>Sancha Pereira, André Alves, Nuno Santos, and Ricardo Chaves</i>	
VMBeam: Zero-Copy Migration of Virtual Machines for Virtual IaaS Clouds	121
<i>Kenichi Kourai and Hiroki Ooba</i>	

Geo-replicated Storage

Inside-Out: Reliable Performance Prediction for Distributed Storage Systems in the Cloud	127
<i>Chin-Jung Hsu, Rajesh K. Panta, Moo-Ryong Ra, and Vincent W. Freeh</i>	
DTC: A Dynamic Transaction Chopping Technique for Geo-replicated Storage Systems	137
<i>Ning Huang, Lihui Wu, and Weigang Wu</i>	
GlobalFS: A Strongly Consistent Multi-site File System	147
<i>Leandro Pacheco, Raluca Halalai, Valerio Schiavoni, Fernando Pedone, Etienne Rivière, and Pascal Felber</i>	
On the Cost of Safe Storage for Public Clouds: An Experimental Evaluation	157
<i>Dorian Burihabwa, Rogério Pontes, Pascal Felber, Francisco Maia, Hugues Mercier, Rui Oliveira, João Paulo, and Valerio Schiavoni</i>	

Algorithms I

Who's On Board?: Probabilistic Membership for Real-Time Distributed Control Systems	167
<i>Rachid Guerraoui, David Kozhaya, Manuel Oriol, and Yvonne-Anne Pignolet</i>	

UDS: A Novel and Flexible Scheduling Algorithm for Deterministic Multithreading	177
<i>Franz J. Hauck, Gerhard Habiger, and Jörg Domaschka</i>	
Practical State Machine Replication with Confidentiality	187
<i>Sisi Duan and Haibin Zhang</i>	
Speed for the Elite, Consistency for the Masses: Differentiating Eventual Consistency in Large-Scale Distributed Systems	197
<i>Daide Frey, Achour Mostefaoui, Matthieu Perrin, Pierre-Louis Roman, and François Taïani</i>	

PhD Forum

Continuous Authentication and Non-repudiation for the Security of Critical Systems	207
<i>Enrico Schiavone, Andrea Ceccarelli, and Andrea Bondavalli</i>	
Including Security Monitoring in Cloud Service Level Agreements	209
<i>Amir Teshome, Louis Rilling, and Christine Morin</i>	
Visualizing and Controlling VMI-Based Malware Analysis in IaaS Cloud	211
<i>Noëlle Rakotondravony and Hans P. Reiser</i>	
Challenging Anomaly Detection in Complex Dynamic Systems	213
<i>Tommaso Zoppi, Andrea Ceccarelli, and Andrea Bondavalli</i>	
PlayCloud: A Platform to Experiment with Coding Techniques for Storage in the Cloud	215
<i>Dorian Burihabwa</i>	
Reliable Event Dissemination in Dynamic Distributed Systems	217
<i>Ugaitz Amozarrain and Mikel Larrea</i>	

Erasure-Coded Storage

ProCode: A Proactive Erasure Coding Scheme for Cloud Storage Systems	219
<i>Peng Li, Jing Li, Rebecca J. Stones, Gang Wang, Zhongwei Li, and Xiaoguang Liu</i>	
SwiftER: Elastic Erasure Coded Storage System	229
<i>Anwitaman Datta and Wan Hee Cho</i>	
Encoding-Aware Data Placement for Efficient Degraded Reads in XOR-Coded Storage Systems	239
<i>Zhirong Shen, Patrick P.C. Lee, Jiwu Shu, and Wenzhong Guo</i>	
Network Aware Reliability Analysis for Distributed Storage Systems	249
<i>Amir Epstein, Elliot K. Kolodner, and Dmitry Sotnikov</i>	

Algorithms II

Collaborative Stabilization	259
<i>Mohammad Roohitavaf and Sandeep Kulkarni</i>	
Adaptive Location Privacy with ALP	269
<i>Vincent Primault, Antoine Boutet, Sonia Ben Mokhtar, and Lionel Brunie</i>	
On Privacy-Preserving Cloud Auction	279
<i>Zhili Chen, Lin Chen, Liusheng Huang, and Hong Zhong</i>	
Experiments with Self-Stabilizing Distributed Data Fusion	289
<i>B. Ducourthial and V. Cherfaoui</i>	

Networking and Systems

TANGO: Toward a More Reliable Mobile Streaming through Cooperation between Cellular Network and Mobile Devices	297
<i>Nawanol Theera-Ampornpunt, Tarun Mangla, Saurabh Bagchi, Rajesh Panta, Kaustubh Joshi, Mostafa Ammar, and Ellen Zegura</i>	
Model-Checking Assisted Protocol Design for Ultra-reliable Low-Latency Wireless Networks	307
<i>Christian Dombrowski, Sebastian Junges, Joost-Pieter Katoen, and James Gross</i>	
Self-Stabilization - A Mechanism to Make Networked Embedded Systems More Reliable?	317
<i>Stefan Lohs, Jörg Nolte, Gerry Siegemund, and Volker Turau</i>	
RDE: Replay DEbugging for Diagnosing Production Site Failures	327
<i>Peipei Wang, Hiep Nguyen, Xiaohui Gu, and Shan Lu</i>	
A Component-Based Middleware for a Reliable Distributed and Reconfigurable Spacecraft Onboard Computer	337
<i>Ting Peng, Kilian Höflinger, Benjamin Weps, Olaf Maibaum, Kurt Schwenk, Daniel Lüdtke, and Andreas Gerndt</i>	
Author Index	343