2013 43rd Annual IEEE/IFIP International Conference on Dependable Systems and Networks

(DSN 2013)

Budapest, Hungary
24 – 27 June 2013
Table of Contents - Research Program

DCCS: Clouds We Can Trust

Tuesday 11:00

CloudPD: Problem Determination and Diagnosis in Shared Dynamic Clouds 1
Bikash Sharma, Praveen Jayachandran, Akshat Verma, Chita R. Das

Mitigating Access-Driven Timing Channels in Clouds using StopWatch 13
Peng Li, Debin Gao, Michael K. Reiter

Yu-Sung Wu, Pei-Keng Sun, Chun-Chi Huang, Sung-Jer Lu, Syu-Fang Lai, Yi-Yung Chen

PDS: Operating Systems Security

Tuesday 11:00

DRIP: A Framework for Purifying Trojaned Kernel Drivers 37
Zhongshu Gu, William N. Sumner, Zhui Deng, Xiangyu Zhang, Dongyan Xu

SPECTRE: A Dependable Introspection Framework via System Management Mode 49
Fengwei Zhang, Kevin Leach, Kun Sun, Angelos Stavrou

Manipulating Semantic Values in Kernel Data Structures: Attack Assessments and Implications 61
Aravind Prakash, Eknath Venkataramani, Heng Yin, Zhiqiang Lin

DCCS: Debugging and Diagnosis

Tuesday 14:00

Why is My Smartphone Slow? On The Fly Diagnosis of Poor Performance on Mobile Internet 73
Chaitrali Amrutkar, Matti Hiltunen, Trevor Jim, Kaustubh Joshi, Oliver Spatscheck, Patrick Traynor, Shobha Venkataraman

Lightweight Message Tracing for Debugging Wireless Sensor Networks 81
Vinaitheerthan Sundaram, Patrick Eugster

Automating the Debugging of Datacenter Applications with ADDA 93
Cristian Zamfir, Gautam Altekar, Ion Stoica

PDS: Stochastic Modeling Techniques

Tuesday 14:00

A Logic for Model-Checking Mean-Field Models 105
Anna Kolesnichenko, Pieter-Tjerk de Boer, Anne Remke, Boudewijn R. Haverkort

Lumpability of Fluid Models with Heterogeneous Agent Types 117
Giulio Iacobelli, Mirco Tribastone

Fitting Second-Order Acyclic Marked Markovian Arrival Processes 128
Andrea Sansottera, Giuliano Casale, Paolo Cremonesi

DCCS: Distributed Dependability

Tuesday 16:00

Fault Detection and Localization in Distributed Systems using Invariant Relationships 140
Abhishek B. Sharma, Haifeng Chen, Min Ding, Kenji Yoshihira, Guofei Jiang

Increasing Network Resiliency by Optimally Assigning Diverse Variants to Routing Nodes 148
Andrew Newell, Daniel Obenshain, Thomas Tantillo, Cristina Nita-Rotaru, Yair Amir

Distal: A Framework for Implementing Fault-tolerant Distributed Algorithms 160
Martin Biely, Pamela Deigado, Zarko Milosevic, André Schiper

PDS: Virtualization

Tuesday 16:00

SIDE: Isolated and Efficient Execution of Unmodified Device Drivers 168
Yifeng Sun, Tzi-cker Chiueh

Security Implications of Memory Deduplication in a Virtualized Environment 180
Jidong Xiao, Zhang Xu, Hai Huang, Haining Wang

State-of-the-Practice in Data Center Virtualization: Toward a Better Understanding of VM Usage 192
Robert Birke, Andrej Podzimek, Lydia Y. Chen, Evgenia Smirni

Presentation of the Carter Award Winner

Wednesday 8:30

Hector: Detecting Resource-Release Omission Faults in Error-Handling Code for Systems Software 204
Suman Saha, Jean-Pierre Lozi, Gael Thomas, Julia L. Lawall, Gilles Muller

DCCS: Coping with Errors

Wednesday 10:30

Generative Software-based Memory Error Detection and Correction for Operating System Data Structures 216
Christoph Borchert, Horst Schirmeier, Olaf Spinczyk

**An Algorithmic Approach to Error Localization and Partial Recomputation for Low-Overhead Fault Tolerance**
Joseph Sloan, Rakesh Kumar, Greg Bronevetsky

**simFI: From Single to Simultaneous Software Fault Injections**
Stefan Winter, Michael Tretter, Benjamin Sattler, Neeraj Suri

### PDS: Memory and Caches

**Wednesday 10:30**

**FTSPM: A Fault-Tolerant Scratchpad Memory**
Amir Mahdi Hosseini Monazzah, Hamed Farbeh, Seyed Ghassem Miremadi, Mahdi Fazeli, Hossein Asadi

**PHYS: Profiled-Hybrid Sampling for Soft Error Reliability Benchmarking**
Jinho Suh, Murali Annavaram, Michel Dubois

**Error Detector Placement for Soft Computation**
Anna Thomas, Karthik Pattabiraman

### DCCS: Seamless, Graceful, and Transparent

**Wednesday 13:00**

**Chasing the Optimum in Replicated In-memory Transactional Platforms via Protocol Adaptation**
Maria Couceiro, Pedro Ruivo, Paolo Romano, Luis Rodrigues

**Seamless Kernel Updates**
Maxim Siniavine, Ashvin Goel

**Application-Driven TCP Recovery and Non-Stop BGP**
Robert Surton, Ken Birman, Robbert van Renesse

### PDS: Experimental Studies and Data Analysis

**Wednesday 13:00**

**A Practical Characterization of a NASA Spacecube Application through Fault Emulation and Laser Testing**
John Paul Walters, Kenneth M. Zick, Matthew French

**An Empirical Investigation of Fault Repairs and Mitigations in Space Mission System Software**
Javier Alonso, Michael Grottke, Allen P. Nikora, Kishor S. Trivedi

**Reading between the Lines of Failure Logs: Understanding How HPC Systems Fail**
DCCS: The Solid Bottom of the System Stack

Wednesday 14:45

Operating SECDED-Based Caches at Ultra-Low Voltage with FLAIR 350
Moinuddin K. Qureshi, Zeshan Chishti

Stress Balancing to Mitigate NBTI Effects in Register Files 361
Hussam Amrouch, Thomas Ebi, Jörg Henkel

PDS: Wireless Networks

Wednesday 14:45

Feng Tan, Yufei Wang, Qixin Wang, Lei Bu, Rong Zheng, Neeraj Suri

Wirelesshart Modeling And Performance Evaluation 383
Anne Remke, Xian Wu

DCCS: Keeping Safe in a Connected World

Wednesday 10:30

Detecting Malicious Landing Pages in Malware Distribution Networks 395
Gang Wang, Jack W. Stokes, Cormac Herley, David Felstead

Redefining Web Browser Principals with a Configurable Origin Policy 406
Yinzhi Cao, Vaibhav Rastogi, Zhichun Li, Yan Chen, Alexander Moshchuk

Practical Automated Vulnerability Monitoring Using Program State Invariants 418
Cristiano Giuffrida, Lorenzo Cavallaro, Andrew S. Tanenbaum

PDS: Storage Systems

Wednesday 10:30

Improving SSD Reliability with RAID via Elastic Striping and Anywhere Parity 430
Jaeho Kim, Jongmin Lee, Jongmoo Choi, Donghee Lee, Sam H. Noh

Geo-replicated storage with scalable deferred update replication 442
Daniele Sciascia, Fernando Pedone

Consistency or Latency? A Quantitative Analysis of Replication Systems Based on Replicated State Machines 454
Xu Wang, Hailong Sun, Ting Deng, Jinfeng Huai
PDS: Network security

Thursday 13:00

Implementing the ADVISE Security Modeling Formalism in MOBIUS 466
Michael D. Ford, Ken Keefe, Elizabeth LeMay, William H. Sanders, Carol Muehrcke

Uniform Node Sampling Service Robust Against Collusions of Malicious Nodes 474
Emmanuelle Anceaume, Yann Busnel, Bruno Sericola

Crossing the Threshold: Detecting Network Malfeasance via Sequential Hypothesis Testing 486
Srinivas Krishnan, Teryl Taylor, Fabian Monrose, John McHugh

PDS: Internet security

Thursday 14:45

Locality Matters: Reducing Internet Traffic Graphs Using Location Analysis 498
Andreas Berger, Stefan Ruehrup, Wilfried N. Gansterer, Oliver Jung

Evasive Bots Masquerading as Human Beings on the Web 510
Jing Jin, Jeff Offutt, Nan Zheng, Feng Mao, Aaron Koehl, Haining Wang