

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

(DSN 2013)

**Budapest, Hungary
24 – 27 June 2013**



**IEEE Catalog Number: CFP13048-POD
ISBN: 978-1-4673-6471-3**

Table of Contents - Research Program

DCCS: Clouds We Can Trust

Tuesday 11:00

CloudPD: Problem Determination and Diagnosis in Shared Dynamic Clouds

Bikash Sharma, Praveen Jayachandran, Akshat Verma, Chita R. Das

Mitigating Access-Driven Timing Channels in Clouds using StopWatch

Peng Li, Debin Gao, Michael K. Reiter

EagleEye: Towards Mandatory Security Monitoring in Virtualized Datacenter Environment

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

Zhongshu Gu, William N. Sumner, Zhui Deng, Xiangyu Zhang, Dongyan Xu

SPECTRE: A Dependable Introspection Framework via System Management Mode

Fengwei Zhang, Kevin Leach, Kun Sun, Angelos Stavrou

Manipulating Semantic Values in Kernel Data Structures: Attack Assessments and Implications

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

Chaitrali Amrutkar, Matti Hiltunen, Trevor Jim, Kaustubh Joshi, Oliver Spatscheck, Patrick Traynor, Shobha Venkataraman

Lightweight Message Tracing for Debugging Wireless Sensor Networks

Vinaitheerthan Sundaram, Patrick Eugster

Automating the Debugging of Datacenter Applications with ADDA

Cristian Zamfir, Gautam Altekar, Ion Stoica

PDS: Stochastic Modeling Techniques

Tuesday 14:00

A Logic for Model-Checking Mean-Field Models

Anna Kolesnichenko, Pieter-Tjerk de Boer, Anne Remke, Boudewijn R. Haverkort

Lumpability of Fluid Models with Heterogeneous Agent Types

Giulio Iacobelli, Mirco Tribastone

Fitting Second-Order Acyclic Marked Markovian Arrival Processes

Andrea Sansottera, Giuliano Casale, Paolo Cremonesi

DCCS: Distributed Dependability

Tuesday 16:00

Fault Detection and Localization in Distributed Systems using Invariant Relationships

Abhishek B. Sharma, Haifeng Chen, Min Ding, Kenji Yoshihira, Guofei Jiang

Increasing Network Resiliency by Optimally Assigning Diverse Variants to Routing Nodes

Andrew Newell, Daniel Obenshain, Thomas Tantillo, Cristina Nita-Rotaru, Yair Amir

Distal: A Framework for Implementing Fault-tolerant Distributed Algorithms

Martin Biely, Pamela Delgado, Zarko Milosevic, André Schiper

PDS: Virtualization

Tuesday 16:00

SIDE: Isolated and Efficient Execution of Unmodified Device Drivers

Yifeng Sun, Tzi-cker Chiueh

Security Implications of Memory Deduplication in a Virtualized Environment

Jidong Xiao, Zhang Xu, Hai Huang, Haining Wang

State-of-the-Practice in Data Center Virtualization: Toward a Better Understanding of VM Usage

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

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

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

Nosayba El-Sayed, Bianca Schroeder

DCCS: The Solid Bottom of the System Stack

Wednesday 14:45

Operating SECDED-Based Caches at Ultra-Low Voltage with FLAIR

Moinuddin K. Qureshi, Zeshan Chishti

Stress Balancing to Mitigate NBTI Effects in Register Files

Hussam Amrouch, Thomas Ebi, Jörg Henkel

PDS: Wireless Networks

Wednesday 14:45

Guaranteeing Proper-Temporal-Embedding Safety Rules in Wireless CPS: A Hybrid Formal Modeling Approach

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

Wireless M2M Modeling And Performance Evaluation

Anne Remke, Xian Wu

DCCS: Keeping Safe in a Connected World

Wednesday 10:30

Detecting Malicious Landing Pages in Malware Distribution Networks

Gang Wang, Jack W. Stokes, Cormac Herley, David Felstead

Redefining Web Browser Principals with a Configurable Origin Policy

Yinzhi Cao, Vaibhav Rastogi, Zhichun Li, Yan Chen, Alexander Moshchuk

Practical Automated Vulnerability Monitoring Using Program State Invariants

Cristiano Giuffrida, Lorenzo Cavallaro, Andrew S. Tanenbaum

PDS: Storage Systems

Wednesday 10:30

Improving SSD Reliability with RAID via Elastic Striping and Anywhere Parity

Jaeho Kim, Jongmin Lee, Jongmoo Choi, Donghee Lee, Sam H. Noh

Geo-replicated storage with scalable deferred update replication

Daniele Sciascia, Fernando Pedone

Consistency or Latency? A Quantitative Analysis of Replication Systems Based on Replicated State Machines

Xu Wang, Hailong Sun, Ting Deng, Jinpeng Huai

PDS: Network security

Thursday 13:00

Implementing the ADVISE Security Modeling Formalism in MOBIUS(**

Michael D. Ford, Ken Keefe, Elizabeth LeMay, William H. Sanders, Carol Muehrcke

Uniform Node Sampling Service Robust Against Collusions of Malicious Nodes(+ (

Emmanuelle Anceaume, Yann Busnel, Bruno Sericola

Crossing the Threshold: Detecting Network Malfeasance via Sequential Hypothesis Testing(, *

Srinivas Krishnan, Teryl Taylor, Fabian Monroe, John McHugh

PDS: Internet security

Thursday 14:45

Locality Matters: Reducing Internet Traffic Graphs Using Location Analysis(- ,

Andreas Berger, Stefan Ruehrup, Wilfried N. Gansterer, Oliver Jung

Evasive Bots Masquerading as Human Beings on the Web) %\$

Jing Jin, Jeff Offutt, Nan Zheng, Feng Mao, Aaron Koehl, Haining Wang

Table of Contents - Supplemental

Student Papers: Software & Network Dependability

Thursday 13:00

A Framework for Runtime V&V in Business-Critical Service Oriented Architectures B#5

Cristiana Areias

Barley: Modelling Program Behavior with Resource Usage B#5

Kevin Leach

Fault-Tolerant Broadcast Algorithms for the Virtual Hypercube Topology B#5

Luiz A. Rodrigues

Student Papers: Hardware Dependability

Thursday 14:45

Improving the Dependability of FPGA-based real-time embedded systems with Partial Dynamic Reconfiguration B#5

José Luís Nunes

Detecting and Tolerating Data Corruptions Due to Device Driver Defects B#5

Francesco Fucci

IOCheck: A Framework to Enhance the Security of I/O Devices at Runtime B#5

Fengwei Zhang

Fast Abstracts – 1

Thursday 10:30

A Review of Cloud Deployment Models For E-Learning Systems &&

Engin Leloglu, Tolga Ayav, Burak Galip Aslan

A View on the Past and Future of Fault Injection &(

Nuno Silva, Ricardo Barbosa, João Carlos Cunha, Marco Vieira

An Adaptive Approach to Dependable Circuits for a Digital Power Control &*

Aromhack Saysanasongkham, Kenta Imai, Masayuki Arai, Satoshi Fukumoto, Keiji Wada

Complementing Static and Dynamic Analysis Approaches For Better Network Defense &),

Himanshu Pareek, N. Sarat Chandra Babu

Design of Event-Based Intrusion Detection System on OpenFlow Network ' \$

Yung-Li Hu, Wei-Bing Su, Li-Ying Wu, Yennun Huang, Sy-Yen Kuo

Fast Abstracts – 2

Thursday 13:00

Evaluating Xilinx SEU Controller Macro for Fault Injection &

José Luís Nunes, João Carlos Cunha, Raul Barbosa, Mário Zenha-Rela

Modeling and Analysing Operation Processes for Dependability (

Xiwei Xu, Liming Zhu, Jim(ZhanWen) Li, Len Bass, Qinghua Lu, Min Fu

Network Traffic Anomaly Detection based on Growing Hierarchical SOM * *

Shin-Ying Huang, Yen-Nun Huang

Performability analysis of RAID10 versus RAID6 ,

Fumio Machida, Jianwen Xiang, Kumiko Tadano, Yoshiharu Maeno, Takashi Horikawa

The Architecture of a Resilience Infrastructure for Computing and Communication Systems (\$

Algirdas Avižienis

Towards Secure Monitoring and Control Systems: Diversify! (&

Domenico Cotroneo, Antonio Pecchia, Stefano Russo

The Third International Workshop on Dependability of Clouds, Data Centers and Virtual Machine Technology

J. Muppala, M. Hiltunen, R. Campbell, P. Verissimo 544

Towards SDN Enabled Network Control Delegation in Clouds 546

M. Malik, M. Montanari, J. Huh, R. Bobba, R. Campbell

Fault-Tolerance Characteristics of Data Center Network Topologies Using Fault Regions 552

Y. Liu, J. Muppala

Availability Study on Cloud Computing Environments: Live Migration as a Rejuvenation Mechanism 558

M. Melo, P. Maciel, J. Araujo, R. Matos, C. Araujo

Dependability Models for Designing Disaster Tolerant Cloud Computing Systems 564

B. Silva, P. Maciel, E. Tavares, A. Zimmermann

Analysis of Bugs in Apache Virtual Computing Lab 570

F. Frattini, R. Ghosh, M. Cinque, A. Rindos, K. Trivedi

Model-based Performance Analysis of Local Re-execution Scheme in Offloading System 576

Q. Wang, H. Wu, K. Wolter

DATAFLASKS: an epidemic dependable key-value substrate 582

F. Maia, M. Matos, R. Vilaca, J. Pereira, R. Oliveira, E. Riviere

Lilliput meets Brobdingnagian: Data Center Systems Management Through Mobile Devices 588

S. Bagchi, F. Arshad

Increasing the Trustworthiness of Commodity Hardware Through Software 594

K. Elphinstone, Y. Shen

Intrusion Detection and Honeypots in Nested Virtualization Environments 600

M. Beham, M. Vlad, H. Reiser

Addressing Memory Exhaustion Failures in Virtual Machines in a Cloud Environment 606

J. Molina, S. Mishra