

2010 International Conference on Dependable Systems and Networks Workshops

(DSN-W 2010)

**Chicago, Illinois, USA
28 June – 1 July 2010**



**IEEE Catalog Number: CFP1041K-PRT
ISBN: 978-1-4244-7729-6**

Table of Contents

DSN 2010 Sponsors	i
Table of Contents	ii
Message from the General Chair and Conference Coordinator	iii
DSN 2010 Organizers	iv
DSN 2010 Steering Committee	v
FTXS Committees	vi
FTXS Program	vii
PFARM Committees	ix
PFARM Program	x
WDSN Committees	xii
WDSN Program	xiii
WRAITS Committees	xv
WRAITS Program	xvi
Citation Information	xviii
DSN-W 2010 Copyright Information	xix
DSN-W 2010 Trademark Information	xx
Author Index	xxi

FTXS Program

1st Workshop on Fault-Tolerance for HPC at Extreme Scale (FTXS)

Monday – June 28th, 2010

Introduction	1
<i>John Daly, Nathan DeBardeleben (Center for Exceptional Computing/Department of Defense)</i>	

Session 1

Quantifying Effectiveness of Failure Prediction and Response in HPC Systems: Methodology and Example	2
<i>James Brandt, Frank Chen, Vincent De Sapio, Ann Gentile, Jackson Mayo, Philippe Pébay, Diana Roe, David Thompson, Matthew Wong (Sandia National Laboratories)</i>	

Session 2

Accurate Fault Prediction of BlueGene/P RAS Logs Via Geometric Reduction	8
<i>Joshua Thompson (Colorado State University), David W. Dreisigmeyer (University of Pittsburgh), Terry Jones (Oak Ridge National Laboratory), Michael Kirby (Colorado State University), Joshua Ladd (University of Pittsburgh)</i>	

A Practical Failure Prediction with Location and Lead Time for Blue Gene/P	15
<i>Ziming Zheng, Zhiling Lan (Illinois Institute of Technology), Rinku Gupta, Susan Coghlan, Peter Beckman (Argonne National Laboratory)</i>	

FTXS Program

Session 3

Distributed Object Storage Rebuild Analysis via Simulation with GOBS	23
<i>Justin M. Wozniak, Seung Woo Son, Robert Ross (Argonne National Laboratory)</i>	
See Applications Run and Throughput Jump: The Case for Redundant Computing in HPC	29
<i>Rolf Riesen, Kurt Ferreira, Jon Stearley (Sandia National Laboratories)</i>	

PFARM Program

2nd Workshop on Proactive Failure Avoidance, Recovery, and Maintenance (PFARM)

Monday – June 28th, 2010

Introduction 35
Miroslaw Malek, Felix Salfner (Humboldt University, Germany), Kishor S. Trivedi (Duke University, USA)

Session 1: Design and Theory

**Aspect Oriented Software Fault Tolerance and Analytically
Redundant Design Framework**..... 38
Kashif Hameed, Rob Williams, Jim Smith (University of the West of England)

A Translation of State Machines to Temporal Fault Trees 45
Nidhal Mahmud, Yiannis Papadopoulos, Martin Walker (University of Hull, UK)

Session 2: Monitoring and Alerting

Fast Entropy Based Alert Detection in Super Computer Logs..... 52
Adetokunbo Makanju, A. Nur Zincir-Heywood, Evangelos E. Milios (Dalhousie University, Canada)

**Qualitative Performance Control in Supervised
IT Infrastructures** 59
Gergely János Paljak, Zoltán Égel, Dániel Tóth, Imre Kocsis, Tamás Kovács házy, András Pataricza (Budapest University of Technology and Economics)

Adaptive Monitoring in Microkernel Oss 66
Domenico Cotroneo, Domenico Di Leo, Roberto Natella (Università degli Studi di Napoli Federico II)

PFARM Program

Session 3: Modeling for Proactive Fault Management

Hybrid, Recursive, Nested Monitoring of Control Systems Using Petri Nets and Particle Filters..... 73

Leila Zouaghi, Achim Wagner, Essam Badreddin (University of Heidelberg)

Rejuvenation with Workload Migration..... 80

Robert S. Hanmer, Veena B. Mendiratta (Alcatel-Lucent)

Session 4: Virtualization

CacheMind: Fast Performance Recovery Using a Virtual Machine Monitor..... 86

Kenichi Kourai (Kyushu Institute of Technology)

WDSN Program

4th Workshop on Dependable and Secure Nanocomputing (WDSN)

Monday – June 28th, 2010

Session 1: Opening and Special Focus on Testing Issues for Nanoelectronics

Workshop Introduction.....93

Jean Arlat (LAAS-CNRS and Université de Toulouse), Cristian Constantinescu (AMD), Ravishankar K. Iyer (UIUC, USA), Johan Karlsson (Chalmers University of Technology, Sweden), Michael Nicolaïdis, (TIMA, France)

Massive Statistical Process Variations: A Grand Challenge for Testing Nanoelectronic Circuits.....95

Bernd Becker (University of Freiburg), Sybille Hellebrand (University of Paderborn), Iliia Polian (University of Passau), Bernd Straube, Wolfgang Vermeiren (Fraunhofer IIS/EAS Dresden), Hans-Joachim Wunderlich (University of Stuttgart, Germany)

Session 2: Soft Errors and Intermittent Faults

Towards Understanding the Effects of Intermittent Hardware Faults on Programs 101

Layali Rashid, Karthik Pattabiraman, Sathish Gopalakrishnan (University of British Columbia, Canada)

Gate Input Reconfiguration for Combating Soft Errors in Combinational Circuits 107

Warin Sootkaneung, Kewal K. Saluja (University of Wisconsin-Madison)

WDSN Program

Verification of Soft Error Detection Mechanism through Fault Injection on Hardware Emulation Platform..... 113
Oscar Ballan, Umberto Rossi, Anne Wantens, Jean-Marc Daveau, Salvatore Nappi, Philippe Roche (STMicroelectronics)

Session 3: Fault-Tolerant Architectures and Resilience

Pair and Swap: An Approach to Graceful Degradation for Dependable Chip Multiprocessors..... 119
Masashi Imai, Tomohide Nagai (University of Tokyo), Takashi Nanya (Canon Inc., Tokyo)

Implementation of Self-Healing Asynchronous Circuits at the Example of a Video-Processing Algorithm 125
Thomas Panhofer, Werner Friesenbichler, Andreas Steininger (Vienna University of Technology)

Fault-Tolerant Communication in 3D Integrated Systems..... 131
Vladimir Pasca, Lorena Anghel, Mounir Benabdenbi (TIMA Laboratory, France)

Session 4: Robustness Enhancement and Trust Management

Towards Self-Timed Logic in the Time-Triggered Protocol..... 136
Markus Furringer (Vienna University of Technology)

A Concept of a Trust Management Architecture to Increase the Robustness of Nano Age Devices..... 142
Thilo Pionteck (University of Lübeck), Werner Brockmann (University of Osnabrück, Germany)

WRAITS Program
6th Workshop on Tgegpv' Cf xcpegu'lp'Kpvt wukqp' / '.....'
'.....'Vqrgt cpv'U{ ugo u (Y TCKU)

Vj vtuf c{ - Junj 3uv, 2010

'Kpvt qf wevkqp'.....36:
'Ok wgr'Eqtt gk. 'Rcyj c 'Rcn'

„Session 3: F gygevkqp'cpf 'Cpcn{ uku

Cpcn{ uku'qh'vj g'Ghtgev'qh'Lcxc 'Uqhwyt ct g'Hcwnu'qp
Ugewt k{ 'Xwpgtcdkklgu'cpf 'Vj gk 'F gygevkqp'd{ "
Eqo o gtekn'Y gd'Xwpgtcdkkl' 'Uecppgt 'Vqqr{.....372
Vcpkc 'Dcuuq. 'Rrpkq' 'Eguct 'Uo qgu' Hgt pcpf gu. 'O ct kq 'Lkq. 'Tgi kpc 'O qt c gu

Cpcn{ uku'qh'c 'O ct mx'F gekkqp 'Rt qegu' O qf gn'
hqt 'Kpvt wukqp 'Vqrgt cpeg.....176
QORcv ken' Mt glf n

Qp 'Tqqvnl'cpf 'O cny ct g'F gygevkqp 'lp 'Uo ct vr j qpgu.....84
Dt { cp 'F kz. q. 'Uj kxc mcpv' O kuj t c

WRAITS Program

Session 2: Systems and Architecture

SCIT and IDS Architectures for Reduced Data Ex-filtration 164

Ajay Nagarajan, Arun Sood (George Mason University, USA)

RAVE: Replicated AntiVirus Engine 170

Carlos Silva (Portugal Telecom), Paulo Sousa, Paulo Veríssimo (University of Lisboa, Portugal)

Realizing S-Reliability for Services via Recovery-driven

Intrusion Tolerance Mechanism 176

Quyên Nguyen, Arun Sood (George Mason University, USA)

Session 3: Evaluation, Assessment and Governance

Assessing the Attack Resilience Capabilities of a

Fortified Primary Backup System 182

Dylan Clarke, Paul Ezhilchelvan (Newcastle University, UK)

A Security Evaluation of a Novel Resilient Web Serving

Architecture: Lessons Learned through

Industry/Academia Collaboration 188

Yih Huang, Anup K. Ghosh (George Mason University), Tom Bracewell, Brian Mastropietro (Raytheon Company, USA)

Survivability and Information Assurance in the Cloud 194

Melvin Greer (Lockheed Martin, USA)