

*Proceedings of*

# The Seventh IEEE International Symposium on Networking Computing and Applications

July 10-12, 2008

Cambridge, Massachusetts, USA



Los Alamitos, California  
Washington • Tokyo

IEEE  
The logo for the IEEE Computer Society consists of the IEEE symbol (a stylized Greek letter phi) followed by the text "computer society".

# **Seventh IEEE International Symposium on Network Computing and Applications**

---

## **NCA 2008**

## **Table of Contents**

<b>Message from the Program Committee</b> .....	x
<b>Conference Organizers</b> .....	xi
<b>Program Committee</b> .....	xii
<b>External Reviewers</b> .....	xv
<b>Sponsors</b> .....	xvi
<b>Invited Keynotes</b> .....	xvii

---

### **Best Paper Session**

APART: Low Cost Active Replication for Multi-tier Data Acquisition Systems .....	1
<i>Paolo Romano, Diego Rughetti, Francesco Quaglia, and Bruno Ciciani</i>	
Quicksilver Scalable Multicast (QSM) .....	9
<i>Krzysztof Ostrowski, Ken Birman, and Danny Dolev</i>	

### **Network Security**

FOSeL: Filtering by Helping an Overlay Security Layer to Mitigate DoS Attacks .....	19
<i>Hakem Beitollahi and Geert Deconinck</i>	
Execution Patterns in Automatic Malware and Human-Centric Attacks .....	29
<i>Mohammed Gadelrab, Anas Abou El Kalam, and Yves Deswarthe</i>	
Finite Memory: A Vulnerability of Intrusion-Tolerant Systems .....	37
<i>Giuliana Santos Veronese, Miguel Correia, Lau Cheuck Lung, and Paulo Verissimo</i>	

## **Peer-to-Peer Systems and Publish/Subscribe Systems**

FaSReD: Fast and Scalable Resource Discovery in Support of Multiple Resource Range Requirements for Computational Grids .....	45
-------------------------------------------------------------------------------------------------------------------------------	----

*Denvil Smith, Nian-Feng Tzeng, and Milad M. Ghantous*

A Fast and Robust Content-based Publish/Subscribe Architecture .....	52
----------------------------------------------------------------------	----

*Hojjat Jafarpour, Sharad Mehrotra, and Nalini Venkatasubramanian*

## **Quality of Service (QoS) Issues and Availability**

Network Planning Optimization for Multimedia Networks .....	60
-------------------------------------------------------------	----

*Priscila Solis Barreto and Paulo H.P. de Carvalho*

User Profile-Based Authorization Policies for Network QoS Services .....	68
--------------------------------------------------------------------------	----

*Julio Cesar Royer, Roberto Willrich, and Michel Diaz*

Multicoordinated Agreement Protocols for Higher Availability .....	76
--------------------------------------------------------------------	----

*Lásaro Jonas Camargos, Rodrigo Malta Schmidt, and Fernando Pedone*

## **Distributed Dependable Storage**

A New Minimum Density RAID-6 Code with a Word Size of Eight .....	85
-------------------------------------------------------------------	----

*James S. Plank*

Generalizing RDP Codes Using the Combinatorial Method .....	93
-------------------------------------------------------------	----

*Wang Gang, Liu Xiaoguang, Lin Sheng, Xie Guangjun, and Liu Jing*

Flexible Parameterization of XOR based Codes for Distributed Storage .....	101
----------------------------------------------------------------------------	-----

*Peter Sobe and Kathrin Peter*

## **Sensor Networks and Mobile Ad-Hoc Networks (MANETs)**

Supporting Concurrent Task Deployment Wireless Sensor Networks .....	111
----------------------------------------------------------------------	-----

*Song Guo, Chunxia Fan, and T.D.C. Little*

Failure, Disconnection and Partition Detection in Mobile Environment .....	119
----------------------------------------------------------------------------	-----

*Denis Conan, Pierre Sens, Luciana Arantes, and Mathieu Bouillaguet*

Cross-Layer Architecture for Differentiated Services in Ad Hoc Networks .....	128
-------------------------------------------------------------------------------	-----

*Maria Fazio, Maurizio Paone, Dario Bruneo, and Antonio Puliafito*

Dynamic Routing Selection for Wireless Sensor Networks .....	136
--------------------------------------------------------------	-----

*Wang Ke and Thomas D.C. Little*

## **Applications in Networked Systems**

Comparing Error Detection Techniques for Web Applications: An Experimental Study .....	144
----------------------------------------------------------------------------------------	-----

*Luis Moura Silva*

Fair-Queued Ethernet for Medical Applications .....	152
-----------------------------------------------------	-----

*Stephan Pöhlsén, Frank Franz, Kai Kück, Jörg-Uwe Meyer, and Christian Werner*

Impact of Social Networking Services on the Performance and Scalability of Web Server Infrastructures .....	160
-------------------------------------------------------------------------------------------------------------	-----

*Claudia Canali, José Daniel Garcia, and Riccardo Lancellotti*

## **Routing Mechanisms and Network Processors**

Is the Popular R*-tree Suited for Packet Classification? .....	168
<i>Christine Maindorfer and Thomas Ottmann</i>	
A Linear Inter-Session Network Coding Scheme for Multicast .....	177
<i>Min Yang and Yuanyuan Yang</i>	
Application-Layer Packet Processing through Ethereal Memory .....	185
<i>Fong Pong and Nian-Feng Tzeng</i>	

## **Protocol Verification and Validation**

On the Application of Formal Methods for Specifying and Verifying Distributed Protocols .....	195
<i>Marina Gelastou, Chryssis Georgiou, and Anna Philippou</i>	
Approaching the Limits of FlexRay .....	205
<i>Christoph Heller, Josef Schalk, Stefan Schneele, and Reinhard Reichel</i>	
An Abstract Channel Specification and an Algorithm Implementing It Using Java Sockets .....	211
<i>Chryssis Georgiou, Peter M. Musial, Alexander A. Shvartsman, and Elaine L. Sonderegger</i>	

## **Short Papers 1**

Multilayered Video Multiple Trees Multicast Algorithms for Heterogeneous Wireless Ad Hoc Networks .....	220
<i>Osamah Badarneh, Michel Kadoch, and Ahmed ElHakeem</i>	
An Improved Anti Collision Algorithm using Parity Bit in RFID System .....	224
<i>SungSoo Kim, YongHwan Kim, SeongJoon Lee, and KwangSeon Ahn</i>	
Feedback-controlled WLAN: Achieving Channel-Availability in Mesh Networks .....	228
<i>Svilen Ivanov, Edgar Nett, André Herms, Daniel Mahrenholz, and Stefan Schemmer</i>	
Police Security Communication over Public Cellular Network Infrastructure .....	232
<i>Rongyu He, Chaowen Chang, Guolei Zhao, Zheng Qin, and Xi Qin</i>	

## **Short Papers 2**

Analysis of Delay Time Distributions in Multistage Interconnection Networks Considering Multicast Traffic .....	236
<i>Marcus Brenner and Armin Zimmermann</i>	
Supporting Cache Coherence in Mobile Cooperative Systems .....	240
<i>Carla Diacui Medeiros Berkenbrock and Celso Massaki Hirata</i>	
Experiments of Large File Caching and Comparisons of Caching Algorithms .....	244
<i>Brad Whitehead, Chung-Horng Lung, Amogelang Tapela, and Gopinath Sivarajah</i>	
Improving Efficiency and Performance of Distributed File-Systems .....	249
<i>Micah Galizia and Hanan Lutfiyya</i>	

## **Short Papers 3**

Persistent Logical Synchrony .....	253
<i>Francesc D. Muñoz-Escóï, Rubén de Juan-Marín, J. Enrique Armendáriz-Íñigo,     and José Ramón González de Mendívil</i>	
EPH: An Efficient and Robust Group Membership Topology for Distributed Systems .....	259
<i>Ravi Madipadaga, Sabishaw Bhaskaran, and Saikat Mukherjee</i>	
Supporting Linearizable Semantics in Replicated Databases .....	263
<i>Luis Rodrigues, Nuno Carvalho, and Emili Miedes</i>	
Randomized Work-Competitive Scheduling for Cooperative Computing on k-partite Task Graphs .....	267
<i>Chadi Kari, Alexander Russell, and Narasimha Shashidhar</i>	
Learning Minimum Delay Paths in Service Overlay Networks .....	271
<i>Hong Li, Lorne Mason, and Michael Rabbat</i>	

## **Short Papers 4**

Discovering New Trends in Web Robot Traffic Through Functional Classification .....	275
<i>Derek Doran and Swapna S. Gokhale</i>	
Effect of Parallel TCP Stream Equalizer on Real Long Fat-pipe Network .....	279
<i>Yutaka Sugawara, Takeshi Yoshino, Hiroshi Tezuka, Mary Inaba, and Kei Hiraki</i>	
Sorting Based Data Centric Storage .....	283
<i>Fenghui Zhang, Anxiao (Andrew) Jiang, and Jianer Chen</i>	
A New Recovery Escalation Algorithm with Load Balancing and Backup Resources Sharing in Path Protected WDM Optical Networks .....	287
<i>Xiaobing Zheng, Lei Guo, Xingwei Wang, Yu Zhang, and Xuekui Wang</i>	

## **Adaptive Grid Computing Workshop**

Identifying Failures in Grids through Monitoring and Ranking .....	291
<i>Demetrios Zeinalipour-Yazti, Kyriacos Neocleous, Chryssis Georgiou,     and Marios D. Dikaiakos</i>	
Adaptive Checkpoint Replication for Supporting the Fault Tolerance of Applications in the Grid .....	299
<i>Andre Luckow and Bettina Schnor</i>	
Autonomic Share Allocation and Bounded Prediction of Response Times in Parallel Job Scheduling for Grids .....	307
<i>Angela Sodan</i>	

## **Trustworthy Network Computing Workshop**

Designing Mechanisms for Reliable Internet-based Computing .....	315
<i>Antonio Fernandez Anta, Chryssis Georgiou, and Miguel A. Mosteiro</i>	
Detecting Selective Forwarding Attacks in Wireless Sensor Networks Using Two-hops Neighbor Knowledge .....	325
<i>Tran Hoang Hai and Eui-Nam Huh</i>	
Secure Data Collection Scheme in Wireless Sensor Network with Mobile Sink .....	332
<i>Amar Rasheed and Rabi Mahapatra</i>	
<b>Author Index</b> .....	341