

# **2009 6th IFIP International Conference on Network and Parallel Computing**

**(NPC 2009)**

**Gold Coast, Australia  
19 – 21 October 2009**



**IEEE Catalog Number: CFP0985E-PRT  
ISBN: 978-1-4244-4990-3**

# 2009 Sixth IFIP International Conference on Network and Parallel Computing

## *NPC 2009*

## Table of Contents

### Preface

### NPC 2009 Committees

### Keynote 1: Using Clouds for Science

### Keynote 2: The Intercloud: Cloud Interoperability at Internet Scale

---

### Session: Network and Parallel Architectures

The Nornir Run-time System for Parallel Programs Using Kahn Process Networks .....	1
<i>Željko Vrba, Pål Halvorsen, Carsten Griwodz, Paul Beskow, and Dag Johansen</i>	
Network Performance of Pruned Hierarchical Torus Network .....	9
<i>M.M. Hafizur Rahman, Xiaohong Jiang, Md. Shahin-Al Masud, and Susumu Horiguchi</i>	
Energy Aware Loop Scheduling for High Performance Multi-Module Memory .....	16
<i>Meikang Qiu, Meiqin Liu, Fei Hu, Shaobo Liu, and Lingfeng Wang</i>	
Super-Peer Availability Prediction Strategy in Unstructured P2P Network .....	23
<i>SooHong Min and JoAnne Holliday</i>	
Impact of Fragmentation Strategy on Ethernet Performance .....	30
<i>Eoin Creedon and Michael Manzke</i>	

### Session: Network Technologies

VirtualNet: Mapping Distributed Communication on a Single Node .....	38
<i>Wangxi Jia, Xuping Tu, Hai Jin, and Xiaofei Liao</i>	
A Virtual Machine Replay System Based on Para-virtualized Xen .....	44
<i>Tao Cui, Hai Jin, Xiaofei Liao, and Haikun Liu</i>	
Optimizing Live Migration of Virtual Machines in SMP Clusters for HPC Applications .....	51
<i>Muhammad Atif and Peter Strazdins</i>	
DPM: A Demand-driven Virtual Disk Prefetch Mechanism for Mobile Personal Computing Environments .....	59
<i>Bin Chen, Nong Xiao, Zhiping Cai, and Ji Wang</i>	

Optimizing Transmission in Multi-Flow Streaming Overlay Networks .....	67
<i>Rui Wang, Depei Qian, Danfeng Zhu, Qinglin Zhu, and Zhongzhi Luan</i>	
Explorations of Honeycomb Topologies for Network-on-Chip .....	73
<i>Alexander Wei Yin, Thomas Canhao Xu, Pasi Liljeberg, and Hannu Tenhunen</i>	
Dynamic Self-configuration of User QoS for Next Generation Network .....	80
<i>Guangsheng Feng, Huiqiang Wang, Bingyang Li, and Zengyou He</i>	
<b>Session: Parallel and Distributed Software</b>	
Adaptive Energy-Efficient Packet Transmission for Voice Delivering in Wireless Sensor Networks .....	86
<i>Junfeng Xu, Keqiu Li, Yanming Shen, Geyong Min, and Wenyu Qu</i>	
Accelerator-Oriented Algorithm Transformation for Temporal Data Mining .....	93
<i>Deprakash Patnaik, Sean P. Ponce, Yong Cao, and Naren Ramakrishnan</i>	
Sleep Scheduling and Gradient Query in Sensor Networks for Target Monitoring .....	101
<i>Ying Guo, Zhongwen Guo, Feng Hong, and Lu Hong</i>	
Bag-of-Tasks Self-Scheduling over Range-Queryable Search Overlays .....	109
<i>Hammurabi das Chagas Mendes, Li Weigang, Azzedine Boukerche, and Alba Cristina Magalhaes Alves de Melo</i>	
Improved Forwarding Architecture and Resource Management for Multi-Core Software Routers .....	117
<i>Norbert Egi, Adam Greenhalgh, Mark Handley, Gainluca Iannaccone, Maziar Manesh, Laurent Mathy, and Sylvia Ratnasamy</i>	
<b>Session: Network Applications</b>	
Re-exploring the Potential of Using Tree Structure in P2P Live Streaming Networks .....	125
<i>Qinglin Zhu, Rui Wang, Depei Qian, and Feng Xiao</i>	
Design and Performance Evaluation of a Versatile Object-Based File System .....	133
<i>Qingsong Wei, Zhixiang Li, Rajesh Vellore Arumugam, and Kyawt Kyawt Khaing</i>	
Performance Evaluation of Parallel Programming in Virtual Machine Environment .....	140
<i>Cong Xu, Yuebin Bai, and Cheng Luo</i>	
BLAST: Off-the-Shelf Hardware for Building an Efficient Hash-Based Cluster Storage System .....	148
<i>George Parissis, George Xylomenos, and Dimitris Gritzalis</i>	
Performance of LAMMPS Code on Intel Quad-Core Xeon .....	156
<i>Mingze Bai, Yusheng Dou, Hong Tang, and Shixin Sun</i>	
An Investigation on a Real Time System over WiFi in Educational Environment .....	161
<i>Norrozila Sulaiman and Che Yahaya Yaakub</i>	
<b>Session: Security, Privacy and Reliability</b>	
Reliable Downloading Algorithms for BitTorrent-like Systems .....	167
<i>Ke Li, Wanlei Zhou, and Ping Li</i>	
Cogset: A Unified Engine for Reliable Storage and Parallel Processing .....	174
<i>Steffen Viken Valvåg and Dag Johansen</i>	

Modeling the Propagation Process of Topology-Aware Worms: An Innovative Logic Matrix Formulation .....	182
<i>Xiang Fan and Yang Xiang</i>	
A Theoretical Model of Lock-Keeper Data Exchange and its Practical Verification .....	190
<i>Sebastian Roschke, Feng Cheng, Thanh-Dien Tran, and Christoph Meinel</i>	
Robust Multi-Server Authentication Scheme .....	197
<i>Eun-Jun Yoon and Kee-Young Yoo</i>	
<b>Session: Network and Parallel Algorithms</b>	
System Level Speedup Oriented Cache Partitioning for Multi-programmed Systems .....	204
<i>Guang Suo and Xue-jun Yang</i>	
A Topology Aggregation Model for Survivability in Multi-Domain Optical Networks Using p-Cycles .....	211
<i>Hamza Drid, Samer Lahoud, Bernard Cousin, and Miklós Molnár</i>	
Search Space Reduction Technique for Distributed Multiple Sequence Alignment .....	219
<i>Manal Helal, Lenore Mullin, John Potter, and Vitali Sintchenko</i>	
GFFC: The Global Feedback Based Flow Control in the NoC Design for Many-core Processor .....	227
<i>Xu Wang, Ge Gan, Dongrui Fan, and Shuxu Guo</i>	
Non-threaded and Threaded Approaches to MultiRail Communication with uDAPL .....	233
<i>Jie Cai, Alistair P. Rendell, and Peter E. Strazdins</i>	
A Network Emergent Computing Model Based on Cellular Automaton .....	240
<i>Hong Tang, Ying Wang, Haitao Wang, and Yu Wu</i>	
Formal Modeling of Parallel System Based on TCPN .....	246
<i>Bin Cheng, Xingang Wang, and Weiqin Tong</i>	

## Author Index