2009 International Conference on Parallel Processing Workshops

(ICPPW 2009)

Vienna, Austria
22–25 September 2009

Editors:

L. Barolli

W.C. Feng

IEEE Catalog Number: CFP09190-PRT
ISBN: 978-1-4244-4923-1

Session XRTS-1: Keynote
Multicore Scheduling Issues in Ericsson Mobile Platforms ....................................................... 1
   Johan Eker

Session XRTS-2: Real Time Systems
How Hard is Partitioning for the Sporadic Task Model? ................................................................. 2
   Nathan Wayne Fisher
Real-Time Divisible Load Theory: A Perspective .............................................................................. 6
   Suriyayati Chuprat, Shaharuddin Salleh, and Steve Goddard
Evaluation of Existing Schedulability Tests for Global EDF ............................................................. 11
   Marko Bertogna

Session XRTS-3: Multicore and Manycore Systems
Hardware Microkernels for Heterogeneous Manycore Systems ....................................................... 19
   Jason Agron and David Andrews
Transition-Aware Dynamic Voltage Scaling for Jitter-Controlled Real-Time Scheduling: A Tree-Structured Approach ................................................................. 27
   Da-Ren Chen and Chiun-Chieh Hsu
Pfairness Applied to EDF to Reduce Migration Overheads and Improve Task Schedulability in Multicore Platforms ................................................................. 35
   K. Pradheep Kumar and A.P. Shanthi

Session XRTS-4: Multiprocessors
Global Multiprocessor Real-Time Scheduling as a Constraint Satisfaction Problem ............................................. 42
   Liliana Cucu-Grosjean and Olivier Buffet
Scheduling Sporadic Tasks on Multiprocessors with Mutual Exclusion Constraints ........................... 50
   Arvind Easwaran and Björn Andersson
Multiprocessor Synchronization and Hierarchical Scheduling ......................................................... 58
   Farhang Nemati, Moris Behnam, and Thomas Nohe
The Second International Workshop on Parallel Programming Models and Systems Software for High-End Computing (P2S2-2009)

Session P2S2-1: Opening Remarks and Invited Keynote—Challenges for System Software on Exascale Platforms by Pete Beckman

Session P2S2-2: Software for Large-Scale Systems

Characterizing the Performance of “Big Memory” on Blue Gene Linux ......................................................... 65
   Kazutomo Yoshii, Kamil Iskra, Harish Naik, Pete Beckmann, and P. Chris Broekema
Flat MPI vs. Hybrid: Evaluation of Parallel Programming Models for Preconditioned Iterative Solvers on “T2K Open Supercomputer” ......................................................... 73
   Kengo Nakajima
Analyzing Checkpointing Trends for Applications on the IBM Blue Gene/P System .................................................................................................................................................. 81
   Harish Gapanati Naik, Rinku Gupta, and Pete Beckman

Session P2S2-3: Communication and I/O

Designing and Evaluating MPI-2 Dynamic Process Management Support for InfiniBand ........................................................................................................................................... 89
   Tejus Gangadharappa, Matthew Koop, and Dhabaleswar K. Panda
CkDirect: Unsynchronized One-Sided Communication in a Message-Driven Paradigm ........................................................................................................................................... 97
   Eric J. Bohm, Sayantan Chakravorty, Pritish Jetely, Abhinav Bhatele, and Laxmikant V. Kale
Exploiting Latent I/O Asynchrony in Petascale Science Applications ..................................................................... 105
   Patrick M. Widener, Mary Payne, Patrick Bridges, Matthew Wolf, Hasan Abbasi, Scott McManus, and Karsten Schwan
Gears4Net—An Asynchronous Programming Model ................................................................................................. 113
   Martin Saternus, Torben Weis, Sebastian Holzapfel, and Arno Wacker

Session P2S2-4: Software for Multicore Architectures

Efficient Parallel Implementation of Molecular Dynamics with Embedded Atom Method on Multi-core Platforms .................................................................................................................. 121
   Changjun Hu, Yali Liu, and Jianjiang Li
Open Source Software Support for the OpenMP Runtime API for Profiling ................................................................. 130
   Oscar Hernandez, Ramachandra C. Nanjegowda, Barbara Chapman, Van Bui, and Richard Kugrin
Just-in-Time Renaming and Lazy Write-Back on the Cell/B.E. ..................................................................................... 138
   Pieter Bellens, Josep M. Perez, Rosa M. Badia, and Jesus Labarta
The Second International Workshop on Simulation and Modelling in Emergent Computational Systems (SMECS-2009)

Session SMECS-1: Modeling of Dynamic Systems
An OpenMP Approach to Modeling Dynamic Earthquake Rupture Along Geometrically Complex Faults on CMP Systems .................................................................146
Xingfu Wu, Benchun Duan, and Valerie Taylor

Wedges Modelling for Electromagnetic Fields Diffraction by Two Horizontal Edges with Arbitrary Angle .................................................................154
Jiro Iwashige and Leonard Barolli

Modeling and Simulation of a Screw-Worm Gear Mechanical Transmission to Achieve its Optimal Design under Imposed Constraints .................................................................160
Claudiu Valentin Suciu, Hozumi Goto, and Hisanori Abiru

Session SMECS-2: Simulation of Dynamic Systems
An Algorithm for Rough Surface Generation with Inhomogeneous Parameters .................................................................166
Kazunori Uchida, Junichi Honda, and Kwang-Yeol Yoon

CUDA Memory Optimizations for Large Data-Structures in the Gravit Simulator .................................................................174
Jakob Siegel, Juergen Ributzka, and Xiaoming Li

New Trends in Large Scale Distributed Systems Simulation .................................................................182
Ciprian Dobre, Florin Pop, and Valentin Cristea

Session SMECS-3: Performance and Modeling of Distributed Systems
Fast Autotuning Configurations of Parameters in Distributed Computing Systems Using Ordinal Optimization .................................................................190
Fan Zhang, Junwei Cao, Lianchen Liu, and Cheng Wu

Towards a Side Access Free Data Grid Resource by Means of Infrastructure Clouds .................................................................198
David Huemer, A. Min Tjoa, Marco Descher, Thomas Feilhauer, and Philip Masser

Performance Evaluation of OpenMP and MPI Hybrid Programs on a Large Scale Multi-core Multi-socket Cluster, T2K Open Supercomputer .................................................................206
Miwako Tsuji and Mitsuhisa Sato

Session DOM-HetNetS-1: Theoretical Design, Analysis, and Optimization Framework

Decentralized Load Balancing for Improving Reliability in Heterogeneous Distributed Systems..............................................................214
Jorge E. Pezoa, Sagar Dhakal, and Majeed M. Hayat

Adaptive Multipath Routing for Congestion Control in InfiniBand Networks ..........................................................222
Diego Lugones, Daniel Franco, and Emilio Luque

Security and Routing Scoped IP Multicast Addresses ..........................................................228
Imed Romdhani, Ahmed Al-Dubai, and Mounir Kellil

An Approach to the Flexible Information/Service Workflow Managing in Distributed Networked Architectures ..........................................................236
Ivan Demydov, Natalia Kryvinska, and Mykhailo Klymash

Session DOM-HetNetS-2: Ubiquitous Networked Systems—Novel Design Approaches

System-Level Virtualization and Mobile IP to Support Service Mobility ..........................................................243
Vittorio Manetti, Roberto Canonico, Giorgio Ventre, and Ioannis Stavrakakis

SOI Framework for the Efficient Management of Complex Resource-Intensive Applications on Constrained Devices ..........................................................249
Natalia Kryvinska, Lukas Auer, and Christine Strauss

Service Naming in Future Mobile Environments ..........................................................256
Nor Shahniza Kamal Bashah, Ivar Jorstad, and Do van Thanh

Session DOM-HetNetS-3: Case Studies Crossing Design, Management, and Practical Implementations

Software Probes: A Method for Quickly Characterizing Applications’ Performance on Heterogeneous Environments ..........................................................262
Alexandre Otto Strube, Dolores Rexachs, and Emilio Luque

Web Accessibility Issues for the Distributed and Interworked Enterprise Portals ..........................................................270
Marie-Luise Leitner, Rudolf Hartjes, and Christine Strauss

A Networked Ubiquitous Computing Environment for Damage Prevention: A Decision Support Framework for the Insurance Sector ..........................................................276
Christine Strauss, Christian Stummer, Christine Bauer, and Alexander Trieb
# The Fifth International Workshop on Scheduling and Resource Management for Parallel and Distributed Systems (SRMPDS-2009)

## Session SRMPDS-1: Resource Scheduling

<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Performance Evaluation of Network-Aware Grid Meta-schedulers</td>
<td>282</td>
</tr>
<tr>
<td>Agustin Caminero, Omer Rana, Blanca Caminero, and Carmen Carrión</td>
<td></td>
</tr>
<tr>
<td>Load Balancing Concurrent BPEL Processes by Dynamic Selection of Web</td>
<td></td>
</tr>
<tr>
<td>Service Endpoints</td>
<td>290</td>
</tr>
<tr>
<td>Marvin Ferber, Sascha Hunold, and Thomas Rauber</td>
<td></td>
</tr>
<tr>
<td>The Owner Share Scheduler for a Distributed System</td>
<td>298</td>
</tr>
<tr>
<td>José Nelson Falavinya Junior, Aleardo Manacero Junior, Miron Livny, and Daniel Bradley</td>
<td></td>
</tr>
</tbody>
</table>

## Session SRMPDS-2: Resource Management

<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Optimizing Migration of Virtual Machines across Data-Centers</td>
<td>306</td>
</tr>
<tr>
<td>Sumit Kumar Bose and Srikanth Sundarajan</td>
<td></td>
</tr>
<tr>
<td>Autonomic SLA Management in Federated Computing Environments</td>
<td>314</td>
</tr>
<tr>
<td>Pawel Rubach and Michael Sobolewski</td>
<td></td>
</tr>
<tr>
<td>SenSORCER: A Framework for Managing Sensor-Federated Networks</td>
<td>322</td>
</tr>
<tr>
<td>Sujit Bhosale and Michael Sobolewski</td>
<td></td>
</tr>
</tbody>
</table>

## The Second International Workshop on Next Generation of Wireless and Mobile Networks (NGWMN-2009)

## Session NGWMN-1: Wireless Networks Applications and Resource Allocation

<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application to Water Quality Monitoring in Malawi</td>
<td></td>
</tr>
<tr>
<td>Marco Zennaro, Athanasios Floros, Gokhan Dogan, Tao Sun, Zhichao Cao,</td>
<td></td>
</tr>
<tr>
<td>Chen Huang, Manzoor Bahader, Herve Ntareme, and Antoine Bagula</td>
<td></td>
</tr>
<tr>
<td>Dynamic Control and Resource Allocation in Wireless-Infrastructured</td>
<td>337</td>
</tr>
<tr>
<td>Distributed Cellular Networks with OFDMA</td>
<td></td>
</tr>
<tr>
<td>Lei You, Ping Wu, Mei Song, Junde Song, and Yong Zhang</td>
<td></td>
</tr>
<tr>
<td>Improvement of Messages Delivery Time on Vehicular Delay-Tolerant</td>
<td>344</td>
</tr>
<tr>
<td>Networks</td>
<td></td>
</tr>
<tr>
<td>Vasco Nuno da Gama de Jesus Soares, Joel José Puga Coelho Rodrigues,</td>
<td></td>
</tr>
<tr>
<td>Paulo Salvador Ferreira, and Antônio Manuel Duarte Nogueira</td>
<td></td>
</tr>
</tbody>
</table>

## Session NGWMN-2: Pervasive and P2P Networks

<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Distributed Decision-Making Mechanism for Wireless P2P Networks</td>
<td>350</td>
</tr>
<tr>
<td>Xu Wu, Jingsha He, Xi Zhang, and Fei Xu</td>
<td></td>
</tr>
<tr>
<td>Link and Route Availability for Inter-working Multi-hop Wireless Networks</td>
<td>356</td>
</tr>
<tr>
<td>Oladayo Salami, Antoine Bagula, and H. Anthony Chan</td>
<td></td>
</tr>
</tbody>
</table>
Audio-Based Self-Organizing Authentication for Pervasive Computing: A Cyber-Physical Approach

Su Jin Kim and Sandeep K.S. Gupta

The Third International Workshop on Advanced Distributed and Parallel Network Applications (ADPNA-2009)

Session ADPNA-1: Programming Models

Optimizing Multi-core MPI Collectives with SMARTMAP

Ron Brightwell and Kevin Pedretti

On the Automatic Detection of Heap-Induced Data Dependencies with Interprocedural Shape Analysis

Adrian Tineo, Francisco Corbera, Angeles Navarro, Rafael Asenjo, and Emilio L. Zapata

Comparing and Optimising Parallel Haskell Implementations for Multicore Machines

Jost Berthold, Simon Marlow, Kevin Hammond, and Abdallah Al Zain

ParalleX—An Advanced Parallel Execution Model for Scaling-Impaired Applications

Hartmut Kaiser, Maciek Brodowicz, and Thomas Sterling

Session ADPNA-2: Distributed and Parallel Algorithms

Exploiting Fine-Grained Pipeline Parallelism for Wavefront Computations on Multicore Platforms

Guiming Wu, Miao Wang, Yong Dou, and Fei Xia

Network Anomaly Detection Using Dissimilarity-Based One-Class SVM Classifier

Jun Ma, Guanzhong Dai, and Zhong Xu

Biodoop: Bioinformatics on Hadoop

Simone Leo, Federico Santoni, and Gianluigi Zanetti

A Scalable Parallel Approach for Peptide Identification from Large-Scale Mass Spectrometry Data

Gaurav Kulkarni, Ananth Kalyanaraman, William R. Cannon, and Douglas Baxter

Session ADPNA-3: Mobile and P2P Computing

A Security-Aware Approach to JXTA-Overlay Primitives

Joan Arnedo-Moreno, Keita Matsuo, Leonard Barolli, and Fatos Xhafa

TARC: A Novel Topology Adaptation Algorithm Based on Reciprocal Contribution in Unstructured P2P Networks

Cai Chen, Sen Su, Kai Shuang, and Fangchun Yang

Test-Driven Service Discovery in Mobile Environments

Ingrid Duda and Oliver Hummel
A Budget-Based Cost-Effective Incentive Model ................................................................. 449
Guiyi Wei, Mande Xie, Yuxin Mao, and Athanasios V. Vasilakos

Session ADPNA-4: Distributed and Parallel Computing and Applications

Estimation of Parameters Sensitivity for Scientific Workflows ........................................... 457
Fakhri Alam Khan, Yuzhang Han, Sabri Pllana, and Peter Brezany

Reliable and Efficient Agreement Protocol in Fully Distributed Systems ............................. 463
Ailixier Aikebaier, Tomoya Enokido, and Makoto Takizawa

Distributed Cluster Architecture for Increasing Energy Efficiency in Cluster Systems ............. 470
Ailixier Aikebaier, Tomoya Enokido, and Makoto Takizawa

Global Variable Partition with Virtually Shared Scratch Pad Memory to Minimize Schedule Length ............................................................................................................ 478
Meikang Qiu, Lei Zhang, Minyi Guo, Fei Hu, Shaobo Liu, and Edwin H.-M. Sha

Assignment Algorithm for Energy Minimization on Parallel Machines ............................... 484
Jaeyeon Kang and Sanjay Ranka

The Fourth International Symposium on Embedded Multicore Systems-on-Chip (MCSoc-2009)

Session MCSOC-1: CAD and NoC

A Heuristic (delta, D) Digraph to Interpolate between Hypercube and de Bruijn Topologies for Future On-Chip Interconnection Networks ........................................... 492
Samer Damaj, Thierry Goubier, Frederic Blanc, and Bernard Pottier

Balanced Dimension-Order Routing for k-ary n-cubes ......................................................... 499
Jose Miguel Montanana, Michihiro Koibuchi, Hiroki Matsutani, and Hideharu Amano

Evaluation of d-mesh Interconnect for SoC ......................................................................... 507
Roman Trobec

Resource Sharing in Networks-on-Chip of Large Many-core Embedded Systems .................. 513
Fadi N. Sibai

Session MCSOC-2: Reconfigurable Multicore

Supporting Multitasking of Pipelined Computations on Embedded Parallel Processor Arrays .................................................................................................................... 520
Dimitris Syrivelis and Spyros Lalis

System Integration of Tightly-Coupled Reconfigurable Processor Arrays and Evaluation of Buffer Size Effects on Their Performance .............................................. 528
Vahid Lari, Frank Hannig, and Jürgen Teich

Runtime Adaptation in Reconfigurable System-on-Chips .................................................... 535
Abdel Ejnioui
Towards a Component-Based Observation of MPSoC ................................................................. 542
Carlos Prada-Rojas, Vania Marangozova-Martin, Kiril Georgiev,
Jean-François Méhaut, and Miguel Santana

Session MCSOC-3: Low Power Design of Multicore

Gating and Serializing the Data Path of CPU for Low Power Consumption ......................................... 550
Rajesh Kannan Megalingam, Venkat Krishnan B., Mithun M., Rahul Srikumar,
and Vineeth Sarma V.

Software and Hardware Design Issues for Low Complexity High Performance Processor Architecture ................................................................. 558
Masashi Masuda, Abderazek Ben Abdallah, and Arquimedes Canedo

An Accurate and Energy Efficient Fetch Direction Orientation Mechanism for Trace Cache ................................................................. 566
Deze Zeng, Minyi Guo, Xin Liu, Song Guo, Hai Jin, and Mianxiong Dong

The Rendezvous Mechanism for the Multi-core AMBA System ................................................................. 574
Jih-Ching Chiu, Kai-Ming Yang, and Mu-Chi Chang

First International Workshop on Distributed XML Processing: Theory and Practice (DXP-2009)

Session 1: Distributed XML Processing

Collaborative Clustering of XML Documents ................................................................. 579
Sergio Greco, Francesco Gullo, Giovanni Ponti, and Andrea Tagarelli

Mining Workflow Processes from XML-Based Distributed Workflow Event Logs ................................................................. 587
Kwanghoon Kim

A Distributed Concurrency Control Mechanism for XML Data ................................................................. 595
Leonardo O. Moreira, Flávio R.C. Sousa, and Javam C. Machado

Privacy Preserving OLAP over Distributed XML Documents ................................................................. 603
Elisa Bertino and Alfredo Cuzzocrea

Author Index