Lecture Notes in Computer Science 5036

Commenced Publication in 1973
Founding and Former Series Editors:
Gerhard Goos, Juris Hartmanis, and Jan van Leeuwen

Editorial Board

David Hutchison
Lancaster University, UK

Takeo Kanade
Carnegie Mellon University, Pittsburgh, PA, USA

Josef Kittler
University of Surrey, Guildford, UK

Jon M. Kleinberg
Cornell University, Ithaca, NY, USA

Alfred Kobsa
University of California, Irvine, CA, USA

Friedemann Mattern
ETH Zurich, Switzerland

John C. Mitchell
Stanford University, CA, USA

Moni Naor
Weizmann Institute of Science, Rehovot, Israel

Oscar Nierstrasz
University of Bern, Switzerland

C. Pandu Rangan
Indian Institute of Technology, Madras, India

Bernhard Steffen
University of Dortmund, Germany

Madhu Sudan
Massachusetts Institute of Technology, MA, USA

Demetri Terzopoulos
University of California, Los Angeles, CA, USA

Doug Tygar
University of California, Berkeley, CA, USA

Gerhard Weikum
Max-Planck Institute of Computer Science, Saarbruecken, Germany

Song Wu Laurence T. Yang Tony Li Xu (Eds.)

Advances in Grid and Pervasive Computing

Third International Conference, GPC 2008
Kunming, China, May 25-28, 2008
Proceedings

Springer

Volume Editors

Song Wu
Huazhong University of Science and Technology
School of Computer Science
Wuhan, Hubei, China, 430074
E-mail:wusong@hust.edu.cn

Laurence T. Yang
Tony Li Xu
St. Francis Xavier University
Department of Computer Science
Antigonish, NS, B2G 2W5, Canada
E-mail: {ltyang,txu}@stfx.ca

Library of Congress Control Number: 2008926600

CR Subject Classification (1998): F.1, F.2, D.1, D.2, D.4, C.2, C.4, H.4, K.6

LNCS Sublibrary: SL 1 – Theoretical Computer Science and General Issues

ISSN 0302-9743
ISBN-10 3-540-68081-0 Springer Berlin Heidelberg New York
ISBN-13 978-3-540-68081-9 Springer Berlin Heidelberg New York

This work is subject to copyright. All rights are reserved, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, re-use of illustrations, recitation, broadcasting, reproduction on microfilms or in any other way, and storage in data banks. Duplication of this publication or parts thereof is permitted only under the provisions of the German Copyright Law of September 9, 1965, in its current version, and permission for use must always be obtained from Springer. Violations are liable to prosecution under the German Copyright Law.

Springer is a part of Springer Science+Business Media

springer.com

© Springer-Verlag Berlin Heidelberg 2008
Printed in Germany

Typesetting: Camera-ready by author, data conversion by Scientific Publishing Services, Chennai, India
Printed on acid-free paper SPIN: 12270415 06/3180 5 4 3 2 1 0

Preface

Welcome to the proceedings of the 2008 International Conference on Grid and Pervasive Computing (GPC 2008) which was held in Kunming, Yunnan, China, May 25–28, 2008.

Grid computing presents a new trend in distributed computing for coordinating large-scale heterogeneous resource sharing and problem solving in dynamic, multi-institutional virtual organizations. Grid computing not only can be used for distributed supercomputing massive data processing, but can also be a common platform and way for utility and service computing. It covers mainframes or supercomputers as well as more powerful personal computers and even small and smart devices, ranging from personal digital assistants to unseen chips in our cars, appliances and telephones. Projecting this trend into the future, we envision an explosion of interconnected high-performance computers and smart devices that can make our research and daily lives easier and more productive. Grid and Pervasive Computing (GPC) is an annual international conference on the emerging areas of merging grid computing and pervasive computing. GPC provides a high-profile, leading-edge forum for researchers and engineers alike to present their latest research in the field of grid computing and pervasive computing.

This year there were 184 paper submissions from all across the world. All the papers were reviewed by at least two referees from the conference's Technical Program Committee or by external reviewers. In order to allocate as many papers as possible and keep the high quality of the conference, we finally decided to accept 45 papers, representing an acceptance rate of 24%. We believe that all of these papers and topics not only provided novel ideas, new results, work in progress and state-of-the-art techniques in this field, but also stimulated future research activities in the area of grid and pervasive computing. This conference was a result of the hard work of very many people such as external reviewers, Program and Technical Committee members. We would like to express our sincere thanks to everyone involved. Ultimately, however, the success of the conference will be judged by how well the delegates participated, learnt, interacted and established contacts with other researchers. The committees provided the venue and created the environment to allow these objectives to be achieved, ensuring that the conference was an outstanding success.

March 2008

Song Wu
Laurence T. Yang
Tony Li Xu

Organization

GPC 2008 was organized by Huazhong University of Science and Technology (HUST) and Yunnan University. It was held in cooperation with the IEEE Computer Society, and *Lecture Notes in Computer Science (LNCS)* of Springer.

Executive Committee

Steering Chairs	Hai Jin, Huazhong University of Science and Technology, China
Steering Members	Christophe Cérin, University of Paris XIII, France Sajal K. Das, University of Texas at Arlington, USA Jean-Luc Gaudiot, The University of California - Irvine, USA Kuan-Ching Li, Providence University, Taiwan Cho-Li Wang, University of Hong Kong, China Chao-Tung Yang, Tunghai University, Taiwan Albert Y. Zomaya, University of Sydney, Australia
General Chairs	Ian Foster, University of Chicago, USA Lionel Ni, Hong Kong University of Science and Technology, China
Program Chairs	Laurence T. Yang, St. Francis Xavier University, Canada Song Wu, Huazhong University of Science and Technology, China
Workshop Chairs	Ching-Hsien Hsu, Chung Hua University, Taiwan Deqin Zou, Huazhong University of Science and Technology, China
Publicity Chairs	Rodrigo F. de Mello, University of Sao Paulo, Brazil Wenbin Jiang, Huazhong University of Science and Technology, China

Publication Chair	Tony Li Xu, St. Francis Xavier University, Canada
Finance and Registration Chair	Xia Xie, Huazhong University of Science and Technology, China
Web Chair	Ke Fan, Huazhong University of Science and Technology, China
Local Chair	Hao Li, Yunnan University, China

Program Committee

Jemal Abawajy	Deakin University, Australia
Nabil Abdennadher	University of Applied Sciences, Switzerland
Mark Baker	University of Reading, UK
Ken Barker	University of Calgary, Canada
Jiannong Cao	Hong Kong Polytechnic University, China
Jerry Hsi-Ya Chang	NCHC, Taiwan
Ruay-Shiung Chang	National Dong Hwa University, Taiwan
Wenguang Chen	Tsinghua University, China
Xiaowu Chen	Beihang University, China
Yeh-Ching Chung	National Tsing Hua University, Taiwan
Toni Cortes	Universitat Politecnica de Catalunya, Spain
Mieso Denko	University of Guelph, Canada
Luiz DeRose	Cray Research, USA
Rudolf Eigenmann	Purdue University, USA
Ke Fan	Huazhong University of Science and Technology, China
Noria Foukia	University of Otago, New Zealand
Wolfgang Gentzsch	Microelectronics Center of North Carolina, USA
Dan Grigoras	University College Cork, Ireland
Xiangjian He	University of Technology Sydney, Australia
Xubin He	Tennessee Technological University, USA
Michael Hobbs	Deakin University, Australia
Hung-Chang Hsiao	National Cheng Kung University, Taiwan
Hui-Huang Hsu	Tamkang University, Taiwan
Bin Hu	Birmingham City University, UK
Kuo-Chan Huang	National Taichung University, Taiwan
Sajid Hussain	Acadia University, Canada
Mohamed Jemni	ESSTT, Tunisia
Stephen Jenks	University of California, USA
Young-Sik Jeong	Wonkwang University, Korea
Weijia Jia	City University of Hong Kong, China
Hai Jiang	Arkansas State University, USA

Wenbin Jiang	Huazhong University of Science and Technology, China
Hai Jin	Huazhong University of Science and Technology, China
Yong-Kee Jun	Gyeongsang National University, Korea
Daniel S. Katz	Louisiana State University, USA
Moon J. Kim	IBM, USA
Domenico Laforenza	CNR, Italy
Francis C.M. Lau	University of Hong Kong, China
Jenq Kuen Lee	National Tsing Hua University, Taiwan
Ruilin Li	Huazhong University of Science and Technology, China
Ming-Lu Li	Shanghai Jiao Tong University, China
Damon Shing-Min Liu	National Chung Chen University, Taiwan
Hai Liu	University of Ottawa, Canada
Pangfeng Liu	National Taiwan University, Taiwan
Victor Malyshkin	Russian Academy of Sciences, Russia
Beniamino Di Martino	Second University of Naples, Italy
Pedro Medeiros	New University of Lisbon, Portugal
Rodrigo F. de Mello	University of Sao Paulo, Brazil
Dan Meng	Institute of Computing Technology, CAS, China
Philippe Navaux	Federal University of Rio Grande do Sul, Brazil
Daniel Olmedilla	Hannover University, Germany
Mohamed Ould-Khaoua	University of Glasgow, UK
Jong Hyuk Park	Kyungnam University, Korea
Jean-Louis Pazat	IRISA, France
Cynthia A. Phillips	Sandia National Laboratories, USA
Wasim Raad	King Fahd University of Petroleum and Minerals, Saudi Arabia
Omer F. Rana	Cardiff University, UK
Sanjay Ranka	University of Florida, USA
Won-Woo Ro	Yonsei University, Korea
David De Roure	University of Southampton, UK
Masoud Sadjadi	Florida International University, USA
Mitsuhisa Sato	Tsukuba University, Japan
Xuanhua Shi	Huazhong University of Science and Technology, China
Pradip K. Srimani	Clemson University, USA
Ruppa K. Thulasiram	University of Manitoba, Canada
Chien-Min Wang	Academia Sinica, Taiwan
Cho-Li Wang	University of Hong Kong, China
Xingang Wang	University of Plymouth, UK
Song Wu	Huazhong University of Science and Technology, China
Jan-Jan Wu	Academia Sinica, Taiwan

Nong Xiao	National University of Defense Technology, China
Naixue Xiong	Japan Advanced Institute of Science and Technology, Japan
Tony Li Xu	St. Francis Xavier University, Canada
Jingling Xue	University of New South Wales, Australia
Laurence T. Yang	St. Francis Xavier University, Canada
Chao-Tung Yang	Tunghai University, Taiwan
Shaowen Yao	Yunnan University, China
Zhiwen Yu	Kyoto University, Japan
Sherali Zeadally	University of the District of Columbia, USA
Xuejie Zhang	Yunnan University, China
Yuezhi Zhou	Tsinghua University, China
Yanmin Zhu	Imperial College London, UK

Additional Reviewers

Hsi-Ya Chang
Patrizio Dazzi
Ahmed Eleuch
Adel Essafi
Hazem Fkaier
Henrique Freitas
Dan Grigoras
Selim Kalayci
Moon Kim
Nicolas Maillard
Juan Martinez
Franco Maria Nardini
Antonio Panciatici
Monica Py
Rodrigo Righi
Khalid Saleem
Roberto Souto
Hailong Sun
Gabriele Tolomei
Nicola Tonellotto
Gianni Valenti
David Villegas
Zhiyong Yu

Table of Contents

Keynote Speeches (Abstracts)

Massively Distributed Systems: From Grids and P2P to Clouds 1
Kai Hwang

Building Distributed, Wide-Area Applications with WheelFS 2
M. Frans Kaashoek

Virtualization Technology: Past, Present, and Future 3
Wen-Hann Wang

Track 1: Cluster Computing

Domino-Effect Free Crash Recovery for Concurrent Failures in Cluster Federation 4
Bidyut Gupta, Shahram Rahimi, Vineel Allam, and Vamshi Jupally

Tidset-Based Parallel FP-tree Algorithm for the Frequent Pattern Mining Problem on PC Clusters 18
Jiayi Zhou and Kun-Ming Yu

Optimizing Communications of Data Parallel Programs in Scalable Cluster Systems 29
Chun-Ching Wang, Shih-Chang Chen, Ching-Hsien Hsu, and Chao-Tung Yang

Track 2: Grid Computing

The Development of a Drug Discovery Virtual Screening Application on Taiwan Unigrid 38
Li-Yung Ho, Pangfeng Liu, Chien-Min Wang, and Jan-Jan Wu

PGWFT: A Petri Net Based Grid Workflow Verification and Optimization Toolkit 48
Haijun Cao, Hai Jin, Song Wu, and Yongcai Tao

A Probability-Based Framework for Dynamic Resource Scheduling in Grid Environment 59
San-Yih Hwang, Jian Tang, and Hong-Yang Lin

A Mobile Agent-Based Statistic Execution Model for Grid Computing 71
Wenyu Qu, Keqiu Li, and Yong Zhang

An Optimization of Resource Replication Access in Grid Cache 83
Fangai Liu and Fenglong Song

ADVE: Adaptive and Dependable Virtual Environments for Grid Computing 93
Xuanhua Shi, Hai Jin, Wei Zhu, and Li Qi

An Incentive Approach for Computational Resource Sharing in the Autonomous Environment 104
Chuliang Weng, Minglu Li, and Xinda Lu

Using Moldability to Improve Scheduling Performance of Parallel Jobs on Computational Grid 116
Kuo-Chan Huang, Po-Chi Shih, and Yeh-Ching Chung

A Fuzzy Grid-QoS Framework for Obtaining Higher Grid Resources Availability 128
David Allenotor and Ruppa K. Thulasiram

Guarantee the Victorious Probability of Grid Resources in the Competition for Finite Tasks 140
Lei Yao, Guanzhong Dai, Huixiang Zhang, and Shuai Ren

Co-allocation in Data Grids: A Global, Multi-User Perspective 152
Adam H. Villa and Elizabeth Varki

Scheduling for Atomic Broadcast Operation in Heterogeneous Networks with One Port Model 166
Ching-Hsien Hsu, Tai-Lung Chen, Bing-Ru Tsai, and Kuan-Ching Li

A Resource Discovery Algorithm with Probe Feedback Mechanism in Multi-domain Grid Environment 178
Libing Wu, Yanxiang He, Jianqun Cui, Simeng Wang, Laurence T. Yang, and Naixue Xiong

Middleware Integration and Deployment Strategies for Cyberinfrastructures 187
Sebastien Goasguen, Krishna Madhavan, David Wolinsky, Renato Figueiredo, Jaime Frey, Alain Roy, Paul Ruth, and Dongyan Xu

A Multi-site Resource Allocation Strategy in Computational Grids 199
Chao-Tung Yang and Sung-Yi Chen

Track 3: High Performance Computing

A Clustering Model for Multicast on Hypercube Network 211
Song Lu and XiaoDong Yang

Performance Evaluation of End-to-End Path Capacity Measurement Tools in a Controlled Environment 222
Wenwei Li, Bin Zeng, Dafang Zhang, and Jinmin Yang

Protein Sequence Motif Discovery on Distributed Supercomputer 232
Santan Challa and Parimala Thulasiraman

Parallel and Distributed Particle Collision Simulation with Decentralized Control 244
Ruipeng Li, Hai Jiang, Hung-Chi Su, Bin Zhang, and Jeff Jenness

Track 4: Network Storage

Modeling and Simulation of Self-similar Storage I/O 256
Zhaobin Liu, Bo Jiang, Zixiang Zhao, and Yunhan Jiang

PCOW: Pipelining-Based COW Snapshot Method to Decrease First Write Penalty 266
Zhikun Wang, Dan Feng, Ke Zhou, and Fang Wang

A Component-Based Analytical Performance Model of IP-Based SAN 275
Min Wang, Wei Xu, and Lu Xu

Track 5: Peer-to-Peer Computing

QCast: A QoS-Aware Peer-to-Peer Streaming System with DHT-Based Multicast 287
Zhinuan Cai and Xiaola Lin

A Construction of Peer-to-Peer Streaming System Based on Flexible Locality-Aware Overlay Networks 296
Chih-Han Lai, Yu-Wei Chan, and Yeh-Ching Chung

Managing Data for Evaluating Trust in Unstructured Peer-to-Peer Networks 308
Zhitang Li, Huaiqing Lin, Chuiwei Lu, and Yejiang Zhang

A Gossip-Based Protocol to Reach Consensus Via Uninorm Aggregation Operator 319
Qiaoli Huang, Shiqun Yin, and Zhixing Huang

HilbertChord: A P2P Framework for Service Resources Management . . . 331
Derong Shen, Yichuan Shao, Tiezheng Nie, Yue Kou, Zhenhua Wang, and Ge Yu

A Peer-to-Peer Assisting Scheme for Live Streaming Services 343
Jian Wan, Liangjin Lu, Xianghua Xu, and Xueping Ren

A Novel Ownership Scheme to Maintain Web Content Consistency 352
Chi-Hung Chi, Choon-Keng Chua, and Weihong Song

Together: A Hybrid Overlay for Application-Layer Multicast in Heterogeneous Environment 364
Zuo Ke, Dong-min Hu, Huai-min Wang, and Quan-yuan Wu

Track 6: Pervasive Computing

Node Placement of Linear Wireless Multimedia Sensor Networks for Maximum Network Lifetime 373
Ming Cao, Laurence T. Yang, Xinmeng Chen, and Naixue Xiong

The Weighted Shortest Path Search in Mobile GIS Services 384
Min Peng, Naixue Xiong, Gang Xie, and Laurence T. Yang

On Maximizing the Throughput of Convergecast in Wireless Sensor Networks 396
Nai-Luen Lai, Chung-Ta King, and Chun-Han Lin

A Self-organizing Communication Architecture for ZigBee 409
Seong Hoon Kim, Jeong Seok Kang, and Hong Seong Park

Track 7: Semantic Web and Semantic Grid

A Semantic Service Matching Middleware for Mobile Devices Discovering Grid Services 422
Tao Guan, Ed Zaluska, and David De Roure

A Pragmatic Approach for the Semantic Description and Matching of Pervasive Resources 434
Ayomi Bandara, Terry Payne, David De Roure, Nicholas Gibbins, and Tim Lewis

An Efficient Method to Measure the Semantic Similarity of Ontologies 447
James Z. Wang, Farha Ali, and Pradip K. Srimani

A Dynamic Awareness Model for Service-Based Collaborative Grid Application in Access Grid 459
Xiaowu Chen, Xiangyu Ji, and Qinping Zhao

Track 8: Service-Oriented Computing

A Suggested Framework for Exploring Contextual Information to Evaluate and Recommend Services 471
Hao Wu, Fei Luo, Xiaomin Ning, and Hai Jin

A Model of Service Scheduling Based on Market Mechanism and Semantic 483
Gang Wang, Yuhui Qiu, and Guolin Pu

Flexible and Semantics-Based Support for Web Services Transaction Protocols 492
Trieu Minh, Nhut Le, and Jinli Cao

EX_QoS Driven Approach for Finding Replacement Services in Distributed Service Composition 504
Lei Yang, Yu Dai, and Bin Zhang

Author Index 517