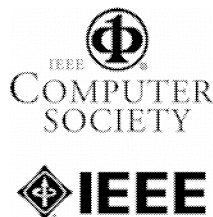


Proceedings

Fifth International Conference on Grid and Cooperative Computing

GCC 2006

21-23 October • Hunan, China



Los Alamitos, California

Washington • Tokyo

Copyright © 2006 by The Institute of Electrical and Electronics Engineers, Inc.
All rights reserved.

Copyright and Reprint Permissions: Abstracting is permitted with credit to the source. Libraries may photocopy beyond the limits of US copyright law, for private use of patrons, those articles in this volume that carry a code at the bottom of the first page, provided that the per-copy fee indicated in the code is paid through the Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

Other copying, reprint, or republication requests should be addressed to: IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, P.O. Box 133, Piscataway, NJ 08855-1331.

The papers in this book comprise the proceedings of the meeting mentioned on the cover and title page. They reflect the authors' opinions and, in the interests of timely dissemination, are published as presented and without change. Their inclusion in this publication does not necessarily constitute endorsement by the editors, the IEEE Computer Society, or the Institute of Electrical and Electronics Engineers, Inc.

IEEE Computer Society Order Number P2694
ISBN-13: 978-0-7695-2694-2
ISBN-10: 0-7695-2694-2
Library of Congress Number 2006930712

Additional copies may be ordered from:

IEEE Computer Society
Customer Service Center
10662 Los Vaqueros Circle
P.O. Box 3014
Los Alamitos, CA 90720-1314
Tel: + 1 800 272 6657
Fax: + 1 714 821 4641
<http://computer.org/cspress>
csbooks@computer.org

IEEE Service Center
445 Hoes Lane
P.O. Box 1331
Piscataway, NJ 08855-1331
Tel: + 1 732 981 0060
Fax: + 1 732 981 9667
[http://shop.ieee.org/store/
customer-service@ieee.org](http://shop.ieee.org/store/customer-service@ieee.org)

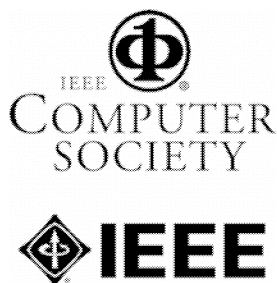
IEEE Computer Society
Asia/Pacific Office
Watanabe Bldg., 1-4-2
Minami-Aoyama
Minato-ku, Tokyo 107-0062
JAPAN
Tel: + 81 3 3408 3118
Fax: + 81 3 3408 3553
tokyo.ofc@computer.org

Individual paper REPRINTS may be ordered at: reprints@computer.org

Editorial production by Lisa O'Conner

Cover art production by Joe Daigle/Studio Productions

Printed in the United States of America by The Printing House



IEEE Computer Society
Conference Publishing Services
<http://www.computer.org/proceedings/>

Table of Contents

Fifth International Conference on Grid and Cooperative Computing GCC 2006

Message from the General Co-Chairs	xi
Message from the Program Co-Chairs	xii
Conference Committee	xiii
Program Committee Members	xiv
Reviewers	xv
Keynote Speakers	xvi

Science 2.0 — Scaling eScience Impact
Ian Foster

Building Shared Collections using Data Grids
Reagan Moore

Adoption of Grid Technologies in Mission Critical Environments
Jinwen Wang

Grid and Autonomic Computing – Future Datacenter Perspective
Mazin Yousif

Grid Architecture, Model, and Algorithm

Redar: A Remote Desktop Architecture for the Distributed Virtual Personal Computing	1
<i>Yuedong Zhang, Zhenhua Song, Dingju Zhu, Zhuan Chen, and Yuzhong Sun</i>	
From Grid Middleware to a Grid Operating System	9
<i>Arshad Ali, Richard McClatchey, Ashiq Anjum, Irfan Habib, Kamran Soomro, Mohammed Asif, Ali Adil, and Athar Mohsin</i>	
Agent Assisted ServiceBSP Model in Grids.....	17
<i>Junqiang Zhu, Weiqin Tong, and Xiaojie Dong</i>	
Middleware Based High Performance and High Available Database Cluster	22
<i>Zhiyuan Shao and Hai Jin</i>	
Aspect Oriented Region Analysis for Efficient Grid Application Reasoning.....	28
<i>Ke Xu, Yuexuan Wang, and Cheng Wu</i>	

Grid Resource Management

Modelling Robust Resource Allocation for Grid Computing	32
<i>Zhimin Tian, Yang Yang, and Zhengli Zhai</i>	
Resource Allocation based on Multi-Objective Programming in Economy Grid: Design and Performance Evaluation	38
<i>Chuntian Cheng, Zhijie Li, Feixue Huang, and Zhendong Cui</i>	
Resource and Bandwidth Allocation on a Computational Grid with Tree Topology	42
<i>Shaoqiang Zhang, Chunyong Ding, and Gang Hou</i>	
Programmable GPUs: New General Computing Resources Available for Desktop Grids	46
<i>Jian Wang, Aobing Sun, Yongbo Li, and Haitao Liu</i>	
Towards a Uniform Monitoring Framework Supporting Interoperability in Grid	50
<i>Kai Shen, Shoubao Yang, Minghua Tian, and Pengzhan Liu</i>	
A Jobs Allocation Strategy for Multiple DRBL Diskless Linux Clusters with Condor Schedulers	54
<i>Chao-Tung Yang, Ping-I Chen, Sung-Yi Chen, and Hao-Yu Tung</i>	

Scheduling Strategy and Algorithm

A Grid Task Scheduling Algorithm Based on QoS Priority Grouping	58
<i>Fang Dong, Junzhou Luo, Lisha Gao, and Liang Ge</i>	
BSM: A Scheduling Algorithm for Dynamic Jobs based on Economics Theory	62
<i>Bo Cao, Yongwei Wu, Guangwen Yang, Jia Liu, and Jianjin Jiang</i>	
An Application-Oriented On-Demand Scheduling Approach in the Computational Grid Environment	66
<i>Zhengxiong Hou, Xingshe Zhou, and Yunlan Wang</i>	
An Effective Scheduling Algorithm for Homogeneous System	71
<i>Yipeng Zhou, Guangzhong Sun, Yunlian Jiang, and Yinlong Xu</i>	
Privacy Preserving C4.5 Algorithm Over Horizontally Partitioned Data	78
<i>Ming-Jun Xiao, Kai Han, Liu-Sheng Huang, and Jing-Yuan Li</i>	
Research on an Effective Mechanism of Task-scheduling in Grid Environment	86
<i>Huyin Zhang, Chanle Wu, Qing Xiong, Libing Wu, and Gang Ye</i>	
A User Satisfaction Level Based Multi-objective Optimization Method for Grid Task Scheduling	93
<i>Xiaoying Wang, Zhihui Du, and Sanli Li</i>	

P2P Computing (1)

DTuples: A Distributed Hash Table based Tuple Space Service for Distributed Coordination	101
<i>Yi Jiang, Guangtao Xue, Zhaoqing Jia, and Jinyuan You</i>	
Network-based Caching Algorithms for Reservation-based Multimedia Systems	107
<i>Bharadwaj Veeravalli, Zeng Zeng, Neeraj Gupta, and Guoguang Jia</i>	
FCAN: A Structured P2P System Based on Content Query	113
<i>Jing Wang, Shoubao Yang, Ying Gao, and Leitao Guo</i>	
Collaborative Deployment Optimization and Dynamic Power Management in Wireless Sensor Networks	121
<i>Xue Wang, Junjie Ma, and Sheng Wang</i>	
Ant-based Reputation Evidence Distribution in P2P Networks	129
<i>Wei Wang, Guosun Zeng, and Lulai Yuan</i>	

Probabilistic Observation Prediction Model based E^4 Scheduling Mechanism in Peer to Peer Grid Computing	133
<i>EunJoung Byun, HongSoo Kim, SungJin Choi, and ChongSun Hwang</i>	

P2P Computing (2)

Research on Self-Organized Evolution of P2P Network Structure	142
<i>Pan Dong and Peidong Zhu</i>	
Network Coding for Peer-to-Peer Live Media Streaming	149
<i>Yajie Liu, Yuxing Peng, Wenhua Dou, and Bo Guo</i>	
Multiple Small-Scale Floods in Unstructured P2P Systems	156
<i>Qi Zhao, Jingdong Xu, and Yun He</i>	
Peer-to-Peer Collaborative Signal Processing for Target Tracking in Wireless Sensor Networks.....	160
<i>Xue Wang and Sheng Wang</i>	
A Bidirectional Query Chord System Based on Latency-Sensitivity	164
<i>Jing Wang, Shoubao Yang, and Leitao Guo</i>	
A Safe, Quick and Scalable Solution to Data Flow Transfer in Wide Area Network of Sensors.....	168
<i>Zhendong Yan, Jianfeng Xu, and Zhumei Dou</i>	
Popularity Biased Hybrid Search in P2P Systems	173
<i>Xiaoqiu Shi and Jinsong Han</i>	

Workflow

Interactive-Event-Based Workflow Simulation in Service Oriented Computing	177
<i>Yanchong Zheng, Yushun Fan, and Wei Tan</i>	
Stochastic Workflow Scheduling with QoS Guarantees in Grid Computing Environments	185
<i>Ali Afzal, John Darlington, and A. Stephen McGough</i>	
A QoS Negotiation Protocol for Grid Workflow	195
<i>Yong Wang, Li Wang, and Chunming Hu</i>	
A Workflow-based Computational Resource Broker with Information Monitoring in Grids	199
<i>Chao-Tung Yang, Cheng-Fang Lin, and Sung-Yi Chen</i>	
A Distributed Workflow Management Approach in CGSP.....	207
<i>Haifeng Ou, Xiaowu Chen, Bin Cai, and Haijun Cao</i>	
Method of Using BDI Agents to Implement Service-oriented Workflow Mapping in AGWMS	213
<i>Lei Cao, Minglu Li, Jian Cao, and Feilong Tang</i>	

High Performance Computing and Network Communications

A New Task Duplication Based Multitask Scheduling Method	221
<i>Kun He and Yong Zhao</i>	
An Efficient Linux Kernel Module Supporting TCP/IP Offload Engine on Grid	228
<i>Soo-Cheol Oh and Seong-Woon Kim</i>	
The Impact of Parallel and Multithread Mechanism on Network Processor Performance	236
<i>Chunqing Wu, Xiangquan Shi, Xuejun Yang, and Jinshu Su</i>	
Parallel Multi-Objective Evolutionary Algorithm with Multi-Front Equitable Distribution	241
<i>Abdelbasset Essabri, Mariem Gzara, and Taïcir Loukil</i>	

Does Fast Responsive AQM Scheme Always Do Better	245
<i>Ming Liu and Wen-hua Dou</i>	

Grid Toolkits and Applications

Execution Management in ChinaGrid Supporting Platform.....	249
<i>Ruyue Ma, Xiangxu Meng, Shijun Liu, and Yongwei Wu</i>	
Gridscape II: A Customisable and Pluggable Grid Monitoring Portal and its Integration with Google Maps	257
<i>Hussein Gibbins and Rajkumar Buyya</i>	
VECON: A Cooperative Event Detection System for Video Sensor Grid	266
<i>Weidong Bao, Jiangfeng Wang, Wei Zhao, and Maojun Zhang</i>	
A Web-based Toolkit for Scheduling Simulation Using GridSim.....	270
<i>Oh-han Kang and Sang-seong Kang</i>	
Network-based Resource Allocation for Grid Computing within an SLA context	274
<i>Dang Minh Quan and D. Frank Hsu</i>	

Resource Discovery and Integration

A Resource Discovery Algorithm with Probe Feedback Mechanism Based on Advance Reservation.....	281
<i>Jianqun Cui, Yanxiang He, Libing Wu, and Fei Li</i>	
Extending an SSI Cluster for Resource Discovery in Grid Computing.....	287
<i>Javier Echaiz and Jorge Ardenghi</i>	
Web Services as a Graph and its Application for Service Discovery	293
<i>Jianxun Liu and Lian Chao</i>	
Grid Information Retrieval Management System for Dynamically Reconfigurable Virtual Organization	301
<i>Yangwoo P. Kim, SeungHa Lee, Pilwoo Lee, and Gregory B. Newby</i>	
Grid Information Service Architecture in ChinaGrid	307
<i>Haihui Zhang, Xingshe Zhou, Zhiyi Yang, Xiaojun Wu, and Yin Luo</i>	

Performance Modeling and Evaluation

A Grid Resource Price-adjusting Strategy Based on Price Influence Model.....	311
<i>Lulai Yuan, Guosun Zeng, and Wei Wang</i>	
Performability Evaluation of Resource Scheduling Algorithms for Computational Grids.....	319
<i>Yang Qu, Chuang Lin, Yajuan Li, and Zhiguang Shan</i>	
Modeling and Performance Analysis of a Priority-based Scheduling Scheme in Service Grid.....	327
<i>Li Li and FangChun Yang</i>	
Modeling and Performance Analysis of Grid Task Scheduling Based on Composition and Reduction of Petri Nets.....	331
<i>Yaojun Han and Xuemei Luo</i>	
Performance Evaluation and Modeling in Grid Resource Management.....	335
<i>Yanbing Liu and Yi Jian</i>	

High Availability and Fault Tolerance

Checkpoint Placement Algorithms for Mobile Agent System.....	339
<i>Jin Yang, Jiannong Cao, and Weigang Wu</i>	
A Checking Mechanism of Software Component Adaptation.....	347
<i>Xiong Xie and Weishi Zhang</i>	
A Model Checking Tool Embedded into Services Composition Environment	355
<i>Chunming Gao, Rongsheng Liu, Yan Song, and Huowang Chen</i>	
Distributed Fault Management for Computational Grids	363
<i>Muhammad Affaan and M.A Ansari</i>	
A Root-fault Detection System of Grid Based on Immunology	369
<i>Li Qian-mu, Xu Man-wu, and Zhang Hong</i>	
A Grid Troubleshooting Method Based on Fuzzy Event.....	374
<i>Li Qian-mu, Xu Man-wu, and Liu Feng-yu</i>	

Grid Security

A Game-Based Intrusion Tolerant Mechanism for Grid Service.....	380
<i>Yuanzhuo Wang, Chuang Lin, Yang Yang, Junjie Lv, and Yang Qu</i>	
Secure, Disjoint, Multipath Source Routing Protocol (SDMSR) for Mobile Ad-Hoc Networks	387
<i>Sebastien Berton, Hao Yin, Chuang Lin, and Geyong Min</i>	
A New Evaluation Strategy Based on Combining CC and SSE-CMM for Security Systems and Products	395
<i>Tan Liang and Zhou Ming-Tian</i>	
A Reflective Framework for Authentication in Grid Computing Environments	404
<i>Jingshu Chen, Hong Wu, Qingyang Wang, Qingguan Wang, and Xuebin Chi</i>	
A Grid Access Control Model Based on Dynamic Negotiating	408
<i>RunLian Zhang, XiaoShe Dong, and XiaoNian Wu</i>	
Secure Communication and Access Control for Web Services Container	412
<i>Yu Peng and Quanyuan Wu</i>	
Standardizing Resource Selection and Access on Computational Grids	416
<i>Huashan Yu and Zhuoqun Xu</i>	

Semantic Grid

Knowledge Fusion in Semantic Grid.....	424
<i>Xiaoqing Zheng, Zhaozhui Wu, and Huajun Chen</i>	
A Semantic Publish/Subscribe System for Selective Dissemination of the RSS Documents.....	432
<i>JianGang Ma, Gang Xu, JinLing Wang, and Tao Huang</i>	
Scientific Text Topics Discovery for e-science Semantic Grid Environment	440
<i>Xiangfeng Luo, Ning Fang, Zhe Yang, Huizhe Xiao, and Weimin Xu</i>	
Developing the Modular Information Provider (MIP) to Support Interoperable Grid Information Services.....	448
<i>Shaowen Wang, Eric Shook, Anand Padmanabhan, Ransom Briggs, and Laura Pearlman</i>	
Towards a Context-Aware Middleware for Deploying Component-Based Applications in Pervasive Computing.....	454
<i>Di Zheng, Jun Wang, Weihong Han, Yan Jia, and Peng Zou</i>	

Service Computing

QoS-aware Composite Service Selection in Grids	458
<i>Yang Qu, Chuang Lin, YuanZhuo Wang, and Zhiguang Shan</i>	
Approaching Simple and Powerful Service-Computing.....	466
<i>Xingwu Liu and Zhiwei Xu</i>	
Tracking Dynamics of Geospatial Phenomena in Distributed and Heterogeneous Environments Using Scientific Workflow and Web Services Technologies	474
<i>Jianting Zhang</i>	
Management and Deployment of the Service-Oriented Sensors in Grid System	482
<i>Xiaoli Gui and Quanxin Zhu</i>	
The Evaluation and Provision Mechanism for FQoS of Web Services	486
<i>Xu Meng, Chen Junliang, and Mei Xiang</i>	
Specification for Concurrency and Communication Characteristic of Grid Service Composition using Pi-calculus.....	490
<i>Jing Zhou and Guosun Zeng</i>	
Towards Context-Aware Composition of Web Services	494
<i>Nan Luo, Junwei Yan, Min Liu, and Shuxin Yang</i>	

Data Grid

Utility-Based Replication Strategies in Data Grids	500
<i>Xindong You, Guiran Chang, Xueyao Chen, Cuihua Tian, and Chuan Zhu</i>	
A Hyper-cube based P2P Information Service for Data Grid.....	508
<i>Hao Ren, Zhiying Wang, and Zhong Liu</i>	
BioGridPSE: Integrated Solution for Bioinformatics Analysis Using Computing and Data Grid	514
<i>Choong-Hyun Sun, Youngwoong Han, Minseong Kim, and Gwan-Su Yi</i>	
An XML Schema-based Semantic Data Integration.....	522
<i>Dongkwang Kim, Karpjoo Jeong, Hyoseop Shin, and Suntae Hwang</i>	
A Service-Oriented Data Integration Architecture and the Integrating Tree	526
<i>Guoshun Hao, Shilong Ma, Jianghua Lv, and Yuefei Sui</i>	

Author Index	531
---------------------------	-----