Proceedings

Fourth IEEE International Conference on eScience

eScience 2008

7-12 December 2008
Indianapolis, Indiana, USA

CPS Conference Publishing Services

Los Alamitos, California

Washington • Tokyo

IEEE computer society

Fourth IEEE International Conference on eScience

eScience 2008

Table of Contents

Regular Papers

A Web Services Architecture for Visualization 1
Jason Wood, Ken Brodlie, Jungwook Seo, David Duke, and Jeremy Walton

SLA-Driven Semantically-Enhanced Dynamic Resource Allocator for Virtualized Service Providers 8
Jorge Ejarque, Marc de Palol, Íñigo Goiri, Ferran Julià, Jordi Guitart, Rosa M. Badia, and Jordi Torres

Grid-Enabled Instrument Representation and Reservation 16
Constantinos Kotsokalis, Tiziana Ferrari, Panagiotis Louridas, Elisabetta Ronchieri, and Panayiotis Tsanakas

Forecasting Duration Intervals of Scientific Workflow Activities Based on Time-Series Patterns 23
Xiao Liu, Jinjun Chen, Ke Liu, and Yun Yang

Estimating Resource Needs for Time-Constrained Workflows 31
Eun-Kyu Byun, Yang-Suk Kee, Ewa Deelman, Karan Vahi, Gaurang Mehta, and Jin-Soo Kim

Provenance in Dynamically Adjusted and Partitioned Workflows 39
Daniel Goodman

Service Oriented Utility Grid for 3-Dimentional Topographic Visualization
from Satellite Images 47
P. Deepak, K. Pramod Kumar, and Geeta Varadan
Soundness and Niceness as Correctness Criteria for Grid Workflows 55
Nikola Trčka, Natalia Sidorova, and Wil van der Aalst
Lowering the Barriers to Cancer Imaging 63
M.S. Avila-Garcia, A.E. Trefethen, M. Brady, F. Gleeson, and D. Goodman
WOOL: A Workflow Programming Language 71
Geoffrey C. Hulette, Matthew J. Sottile, and Allen D. Malony
Re-thinking Grid Security Architecture 79
Yuri Demchenko, Cees de Laat, Oscar Koeroo, and David Groep
Secure, Performance-Oriented Data Management for nanoCMOS Electronics 87
R. O. Sinnott, C. Bayliss, C. Davenhall, B. Harbulot, M. Jones, C. Millar, G. Roy, S. Roy, G. Stewart, J. Watt, and A. Asenov
Detecting Communities in Science Blogs 95
Christina K. Pikas
User Friendly Management of Workflow Results: From Provenance
Information to Grid Logical File Names 103
Tristan Glatard and Silvia D. Olabarriaga
Scalable Semantics – The Silver Lining of Cloud Computing 111
Andrew Newman, Yuan-Fang Li, and Jane Hunter
QoS-Based Web Service Composition Accommodating Inter-service
Dependencies Using Minimal-Conflict Hill-Climbing Repair Genetic Algorithm 119
Lifeng Ai and Maolin Tang
End-to-End eScience: Integrating Workflow, Query, Visualization,
and Provenance at an Ocean Observatory 127
Bill Howe, Peter Lawson, Renee Bellinger, Erik Anderson, Emanuele Santos, Juliana Freire, Carlos Scheidegger, António Baptista, and Cláudio Silva
Towards an Acoustic Environmental Observatory 135
Richard Mason, Paul Roe, Michael Towsey, Jinglan Zhang, Jennifer Gibson, and Stuart Gage
Sensor Metadata Management and Its Application in Collaborative
Environmental Research 143
Nicholas Dawes, K. Ashwin Kumar, Sebastian Michel, Karl Aberer, and Michael Lehning
Reducing Time-to-Solution Using Distributed High-Throughput
Mega-Workflows - Experiences from SCEC CyberShake 151
Scott Callaghan, Philip Maechling, Ewa Deelman, Karan Vahi, Gaurang Mehta, Gideon Juve, Kevin Milner, Robert Graves, Edward Field, David Okaya, Dan Gunter, Keith Beattie, and Thomas Jordan
BioVLAB-Microarray: Microarray Data Analysis in Virtual Environment 159
Youngik Yang, Jong Youl Choi, Kwangmin Choi, Marlon Pierce, Dennis Gannon, and Sun Kim

A Distributed Algorithm for Determining the Provenance of Data 166
Paul T. Groth
VO-enabled Service Harmonization in the GEO Grid 174
Naotaka Yamamoto, Isao Kojima, Yoshio Tanaka, and Satoshi Sekiguchi
myExperiment: Defining the Social Virtual Research Environment 182
David De Roure, Carole Goble, Jiten Bhagat, Don Cruickshank, Antoon Goderis, Danius Michaelides, and David Newman
An Extensible, Scalable Architecture for Managing Bioinformatics Data and Analyses 190
Anuj R. Shah, Mudita Singhal, Tara D. Gibson, Chandrika Sivaramakrishnan, Katrina M. Waters, and Ian Gorton
Classification of Different Approaches for e-Science Applications in Next Generation Computing Infrastructures 198
Morris Riedel, Achim Streit, Felix Wolf, Thomas Lippert, and Dieter Kranzlmüller
Characterizing User-Level Network Virtualization: Performance, Overheads and Limits 206
Maurício Tsugawa and José A. B. Fortes
MRPGA: An Extension of MapReduce for Parallelizing Genetic Algorithms 214
Chao Jin, Christian Vecchiola, and Rajkumar Buyya
CloudBLAST: Combining MapReduce and Virtualization on Distributed Resources for Bioinformatics Applications 222
Andréa Matsunaga, Maurício Tsugawa, and José Fortes
A Library for Asynchronous Concurrent Service Orchestration 230
Wei Lu and Dennis Gannon
Meandre: Semantic-Driven Data-Intensive Flows in the Clouds 238
Xavier Llorà, Bernie Ács, Loretta S. Auvil, Boris Capitanu, Michael E. Welge, and David E. Goldberg
ARCHER – An Enabler of Research Data Management 246
Ian Atkinson, Ashley M Buckle, David Groenewegen, Nick Nicholas, Andrew Treloar, and Anthony Beitz
Distributed Replica-Exchange Simulations on Production Environments Using SAGA and Migol 253
André Luckow, Shantenu Jha, Joohyun Kim, Andre Merzky, and Bettina Schnor
Parallel Processing of Large-Scale XML-Based Application Documents on Multi-core Architectures with PiXiMaL 261
Michael R. Head and Madhusudhan Govindaraju
The Grid Browser: Improving Usability in Service-Oriented Grids by Automatically Generating Clients and Handling Data Transfers 269
Steffen Heinzl, Markus Mathes, and Bernd Freisleben
MapReduce for Data Intensive Scientific Analyses 277
Jaliya Ekanayake, Shrideep Pallickara, and Geoffrey Fox

SWARM: Scheduling Large-Scale Jobs over the Loosely-Coupled HPC Clusters 285
Sangmi Lee Pallickara and Marlon Pierce
Experiences from Cyberinfrastructure Development for Multi-user Remote Instrumentation 293
Prasad Calyam, Abdul Kalash, Neil Ludban, Sowmya Gopalan, Siddharth Samsi, Karen Tomko, David E. Hudak, and Ashok Krishnamurthy
Contextualization: Providing One-Click Virtual Clusters 301
Katarzyna Keahey and Tim Freeman
The Rails Toolkit – Enabling End-System Topology-Aware High End Computing 309
Venkatram Vishwanath, Jason Leigh, Sungwon Nam, Luc Renambot, Takashi Shimizu, Hirokazu Takahashi, Makoto Takizawa, and Osamu Kamatani

Demo Papers

The Trident Scientific Workflow Workbench 317
Roger Barga, Jared Jackson, Nelson Araujo, Dean Guo, Nitin Gautam, and Yogesh Simmhan
Stereoscopic Visualization of Scientific and Medical Content for Education: Seeing in 3D 319
Albert William
Biocep, Towards a Federative, Collaborative, User-Centric, Grid-Enabled and Cloud-Ready Computational Open Platform 321
Karim Chine
Gridbus Workflow Management System on Clouds and Global Grids 323
Suraj Pandey, Chao Jin, William Voorsluys, Mustafizur Rahman, and Rajkumar Buyya
The Indiana Clinical Translational Sciences Institute HUB 325
William K. Barnett
Mendeley - A Last.fm For Research? 327
Victor Henning and Jan Reichelt
Support for Cooperative Experiments in VL-e: From Scientific Workflows to Knowledge Sharing 329
Zhiming Zhao, Adam Belloum, Marian Bubak, and Bob Hertzberger
Research Intelligence: A Social Networking Toolset Supporting Multidiscipliary E-Science 331
Jerry Sheehan
Open Grid Computing Environment's Workflow Suite for E-Science Projects 332
Suresh Marru, Marlon Pierce, Chathura Herath, and Srinath Perera
The SURA-Microsoft Biomedical and Geosciences Research Demo 334
Linda Akli, Gary Crane, Dali Wang, and Brian Hammond

SALSA Project: Parallel Data Mining of GIS, Web, Medical, Physics, Chemical, and Biology Data 335
Xiaohong Qiu, Geoffrey Fox, Seung-Hee Bae, Jong Youl Choi, Jaliya Ekanayake, and and Yang Ruan

Poster Papers

Application Hosting Services in a Virtual Organization That Supports Multiple Grid Environments 337
Hitohide Usami and Hiroyuki Kanazawa
The HDF5-iRODS Module: A Data Grid System for Object Level Access 339
Peter Cao and Mike Wan
An Interactive Multimedia Web Editor 341
Christine Lin, Fei-Pi Chu, Hsiang-An Wang, and Ju-Chun Ko
OGSA-DAI: Middleware for Data Integration: Selected Applications 343
Alistair Grant, Mario Antonioletti, Alastair C. Hume, Amy Krause, Bartosz Dobrzelecki, Michael J. Jackson, Mark Parsons, Malcolm P. Atkinson, and Elias Theocharopoulos
End-to-End Cyberinfrastructure for Real-Time Enviornmental Decision Support 344
David J. Hill, Yong Liu, James Myers, and Barbara Minsker
Concrete Partial Evaluation in Ruby 346
Andrew Keep and Arun Chauhan
Producing and Sharing Regional Weather Forecast Data for e-Science Applications 348
Marcus Carvalho, Eliane Araújo, Renato O. Fernandes, and Rodolfo L. B. Nóbrega
A Wireless Non-invasive Real-Time Monitoring Blood Lactate Test for a Moving Subject 350
Birhan Payli and Arjan Durresi
Scientific Computing Autonomic Reliability Framework 352
Abhishek Dubey, Sandeep Neema, Jim Kowalkowski, and Amitoj Singh
Data Visualization and Analysis of CIC Graduate Student TeraGrid Resource Usage 354
Erik Johnson and Elaine Wah
A Model for Communication in Clusters of Multi-core Machines 356
Christine Task and Arun Chauhan
Compile-Time Disambiguation of MATLAB Types through Concrete Interpretation with Automatic Run-Time Fallback 358
Chun-Yu Shei and Arun Chauhan
EUAsiaGrid – Widening the Uptake of e-Research in the Asia-Pacific Region 360
Alex Voss
Visualization and Analysis of GPU Summer School Applicants and Participants 362
Elaine Wah, Erik Johnson, Loretta Auvil, Umesh Thakkar, Wen-Mei Hwu, David Kirk, Thom H. Dunning, and Sharon C. Glotzer

Immune System Modeling with Infer.NET 364
Vincent Y.F. Tan, John Winn, Angela Simpson, and Adnan Custovic
Observatory Middleware Framework 366
Randal Butler, Terry Fleury, Von Welch, John Graybeal, Duane Edgington, Kevin Gomes, and Bob Herlien
Imagery Data Mining: The IDEC Experiment 368
Johann van Reenen, Diana E. Northup, M. Alex Baker, Christy Crowley, Brian Freels-Stendel, Linn Marks Collins, Mark L. B. Martinez, and James E. Powell
OGSA-DWC: A Middleware for Deep Web Crawling Using the Grid 370
Jihwan Song, Dong-Hoon Choi, and Yoon-Joon Lee
Integration of Avian Influenza Virus Information Sources for Korea e-Science 372
WooLam Kang, Dong-Hoon Choi, Young-Kyun Suh, and Yoon-Joon Lee
An Algorithm in SwinDeW-C for Scheduling Transaction-Intensive Cost-Constrained Cloud Workflows 374
Yun Yang, Ke Liu, Jinjun Chen, Xiao Liu, Dong Yuan, and Hai Jin
Digital Video Retrieval via Mobile Devices 376
Chih-Min Chen, Yu-Zheng Wang, Hsiang-An Wang, and Chih-Yi Chiu
AirScope: A Micro-Scale Urban Air Quality Management System 378
Jung-Hun Woo, Sang Boem Lim, Karpjoo Jeong, HyungSeok Kim, Jae-Jin Kim, Jonghyun Lee, Junghee Kim, Taehoon Lee, Le Dinh Minh, Rina Ryoo, Suhyang Kim, Hansoo Kim, and Jee In Kim
Adding Standards Based Job Submission to a Commodity Grid Broker 380
David Colling, A. Stephen McGough, Jazz Mack Smith, Vesso Novov, Tiejun Ma, David Wallom, and Xin Xiong
InterNano: e-Science for the Nanomanufacturing Community 382
Rebecca Reznik-Zellen, Bob Stevens, Michael Thorn, Jeff Morse, Mark Smucker, James Allan, David Mimno, Andrew McCallum, and Mark Tuominen
GENI Meta-Operations Center 384
Jon-Paul Herron
Virtual Sensors in a Web 2.0 Virtual Watershed 386
Yong Liu, Luigi Marini, Rob Kooper, Alejandro Rodriguez, David Hill, James Myers, and Barbara Minsker
Mobile e-Lab: A Mobile Personalized Virtual Research Computing Environment 388
Yanwen Ju, Yuebin Bai, and Depei Qian
Cluster-Based Hybrid Scheduling Mechanisms for Workflow Applications on the Grid 390
Yang Zhang, Charles Koelbel, and Keith Cooper
Parameter Estimation Using Scientific Workflows 392
David Abramson, Colin Enticott, and Tom Peachey

BXGrid: A Data Repository and Workflow Abstraction for Biometrics Research 394
Hoang Bui, Deborah Thomas, Michael Kelly, Christopher Lyon, Douglas Thain, and Patrick Flynn
Replica Aware Reliable File Transfer Service for the Data Grid 396
Yoonki Lee, Eunsung Kim, and Heon Y. Yeom
Using Mediation to Achieve Provenance Interoperability (Extended Abstract) 398
Tommy Ellkvist, David Koop, Juliana Freire, Cláudio Silva, and Lena Strömbäck
Enabling Data Transport between Web Services through alternative protocols and Streaming 400
Spiros Koulouzis, Edgar Meij, M. Scott Marshall, and Adam Belloum
Monitoring and Managing E-Science Cyber-Infrastructures: A Case Study 402
Srinath Perera, Suresh Marru, and Dennis Gannon
Shared Genomics: Accessible High Performance Computing for Genomic Medical Research 404
Mark Delderfield, Lee Kitching, Gareth Smith, David Hoyle, and Iain Buchan
Metamodel-Based Generation of WSRF-Compliant SOA for Collaborative Cancer Research 406
Tianyi Zang, Radu Calinescu, Steve Harris, Andrew Tsui, Charles Crichton, Marta Kwiatkowska, Jeremy Gibbons, Jim Davies, James Brenton, and Carlos Caldas
Cyberinfrastructure Collaboration for Distributed Digital Preservation 408
Chris Jordan, Robert H. McDonald, David Minor, and Ardys Kozbial
Exploiting Latent I/O Asynchrony in Petascale Science Applications 410
Mary Payne, Patrick Widener, Matthew Wolf, Hasan Abbasi, Scott McManus, Patrick G. Bridges, and Karsten Schwan
An Overview of the Granules Runtime for Cloud Computing 412
Shrideep Pallickara, Jaliya Ekanayake, and Geoffrey Fox
MAEviz: Bridging the Time-from-Discovery Gap between Seismic Research and Decision Making 414
Shawn D. Hampton, Jong Sung Lee, Nathan L. Tolbert, Terrence M. McLaren, Christopher M. Navarro, James D. Myers, B. F. Spencer Jr., and Amr S. Elnashai
Advanced Information Delivery System for the Abraham Lincoln Writings 416
Michal Ondrejcek, Rob Kooper, and Peter Bajcsy
A Hybrid Peer-to-Peer and Grid Job Scheduling System for Teaming Up Desktop Resources with Computer Clusters to Perform Turbulence Simulations 418
Kay Dörnemann, Tim Dörnemann, Bernd Freisleben, Tobias M. Schneider, and Bruno Eckhardt
Rule-Based Classification Systems for Informatics 420
B. Krishnamurthy, T. Malik, S. Stamatis, V. Venkatasubramanian, and J. Caruthers
BioMashups: The New World of Exploratory Bioinformatics? 422
Jiro Sumitomo, James M. Hogan, Felicity Newell, and Paul Roe

Provenance Collection in an Industry Biochemical Discovery Cyberinfrastructure 424
Bin Cao, Girish Subramanian, Sribabu Doddapaneni, and Beth Plale
Communicating Security Assertions over the GridFTP Control Channel 426
Rajkumar Kettimuthu, Liu Wantao, Frank Siebenlist, and Ian Foster
Schema-Independent and Schema-Friendly Scientific Metadata Management 428
Scott Jensen and Beth Plale
Storage Space - Advance Reservation and Scheduling 430
Sree Lakshmi D. Gudreddi and Silvia Figueira
Hydrological Sensor Web for the South Esk Catchment in the Tasmanian state of Australia 432
Siddeswara Mayura Guru, Peter Taylor, Holger Neuhaus, Yanfeng Shu, Daniel Smith, and Andrew Terhorst
On Building Scientific Workflow Systems for Data Management in the Cloud 434
Yogesh Simmhan, Roger Barga, Catharine van Ingen, Ed Lazowska, and Alex Szalay
Web 2.0-Based Semantic Data, Document and Event Management Environment 436
Kailash Kotwani, Yong Liu, Joe Futrelle, James Myers, Luigi Marini, Rob Kooper, and Terry McLaren
Digital Agriculture: Learning to Feed a Hungry World 438
James Myers, Terry McLaren, and Andrew Wadsworth
Advanced Information Systems for Archival Appraisals of Contemporary Documents 440
William McFadden, Kenton McHenry, Rob Kooper, Michal Ondrejcek, Alex Yahja, and Peter Bajcsy
Scientific Mashups: Runtime-Configurable Data Product Ensembles 442
Harrison Green-Fishback and Bill Howe
Publishing Active Workflows to Problem-Focused Web Spaces 444
Luigi Marini, Rob Kooper, Peter Bajcsy, and James D. Myers
Coupling Computers to Living Cells for Automated Knowledge Extraction 446
Daniel E. Callahan
Knowledge Spaces and Scientific Data 448
Joe Futrelle, Jeff Gaynor, Joel Plutchak, Peter Bajcsy, Jason Kastner, Kailash Kotwani, Jong Sung Lee, Luigi Marini, Rob Kooper, Robert E. McGrath , Terry McLaren, Yong Liu, and James D. Myers
Network and Physical Upgrade of EV Wilkins Computing Center to Support a 600 Node Grid Used with Remote Sensing of SAR Polar DATA 450
Sharonda Walton, Linda Hayden, and Kuchumbi Hayden
Bio-Sense: A System for Supporting Sharing and Exploration in Bioinformatics Using Semantic Web Services 452
Athman Bouguettaya, Mark Hepburn, Qing Liu, Kai Xu, and Ji Zhang

Semantic Framework for Free-Form Search of Grid Resources 454
Chaitali Gupta and Madhusudhan Govindaraju

Workshop: Riding the Geoscience Cyberinfrastructure Wave of Data

Riding the Geoscience Cyberinfrastructure Wave of Data: Real Time Data Use in Education Workshop 456
Beth Plale and Bin Cao
MAEviz: Exploring Earthquake Risk Reduction Strategies 457
Christopher M. Navarro, Shawn D. Hampton, Jong Sung Lee, Nathan L. Tolbert, Terrence M. McLaren, James D. Myers, B. F. Spencer Jr., and Amr S. Elnashai
Online CReSIS and Polar Resources for Education 458
Ryan Bowman and Linda Hayden
The Potential of Grid-Enabled Learning for High Impact Weather with LEAD 459
Sepideh Yalda and Richard Clark
Southeastern Universities Research Association (SURA) Coastal Ocean Observing and Prediction (SCOOP) 460
Sandra L. Harper
An Educator's Perspective on Cyberinfrastructure 461
Polly Baker, Cathy Brown, and Adam Maltese

Workshop: Project Management and User Engagement

Good Partners are Hard to Find: The Search for and Selection of Collaborators in the Health Sciences 462
Heiko Spallek, Titus Schleyer, and Brian S. Butler
The Challenges of Distributed Scientific Collaboration among Top Scientists--A Case Study 468
Airong Luo
The Power of Cyberinfrastructure in Building Grassroots Networks: A History of the Pacific Rim Applications and Grid Middleware Assembly (PRAGMA), and Lessons Learned in Developing Global Communities 470
Peter Arzberger and Grace S. Hong
Trials and Tribulations of the UK National Grid Service 471
Gillian M. Sinclair
Why Good Software Sometimes Dies – And How to Save It 475
Neil P. Chue Hong and Alex Voss

Workshop: International Grid Interoperability & Interoperation Workshop 2008 (IGIIW 2008)

Towards Making BOINC and EGEE Interoperable 478
P. Kacsuk, Z. Farkas, and G. Fedak
Cross-Domain Middlewares Interoperability for Distributed Aircraft Design Optimization 485
Yongjian Wang, D'Ippolito Roberto, Mike Boniface, Depei Qian, Degang Cui, and Jiyun Jiang
Interoperability between ARC and gLite - Understanding the Grid-Job Life Cycle 493
M. Grønager, D. Johansson, J. Kleist, C. Søttrup, A. Wäänänen, L. Field, D. Qing, K. Happonen, and T. Lindén
Grid Information System Interoperability: The Need For A Common Information Model 501
Laurence Field, Sergio Andreozzi, and Balázs Kónya
Modeling and Evaluating Interoperable Grid Systems 508
Ivan Rodero, Francesc Guim, and Julita Corbalan
Integration of GridFTP as an Alternative File Transfer in UNICORE for the DEISA Infrastructure 516
Michael Rambadt, Andrea Vanni, and Ralph Niederberger
Functional Analysis and Architecture for Interoperable and DVO-Specific Grid Monitoring Services 524
Timo Baur

Workshop: PRAGMA Workshop on e-Science Highlights

A Cyber Environment for Engineering Cyber Education 532
Jongbae Moon, Kum Won Cho, Soon-Heum Ko, Jin-Ho Kim, Chongam Kim, and Yoonhee Kim
Optimized Rendering for a Three-Dimensional Videoconferencing System 540
Rachel Chu, Daniel Tenedorio, Jürgen P. Schulze, Susumu Date, Seiki Kuwabara, Atsushi Nakazawa, Haruo Takemura, and Fang-Pang Lin
Identification of a Specific Inhibitor for the Dual-Specificity Enzyme SSH-2 via Docking Experiments on the Grid 547
Phillip D. Pham, Marshall J. Levesque, Kohei Ichikawa, Susumu Date, and Jason H. Haga
Virtual Screening for SHP-2 Specific Inhibitors Using Grid Computing 555
Simon X. Han, Marshall J. Levesque, Kohei Ichikawa, Susumu Date, and Jason H. Haga
Implement the Grid Workflow Scheduling for Data Intensive Applications with CSF4 563
Zhaohui Ding, Xiaohui Wei, Yifan Zhu, Yaoguang Yuan, Wilfred W. Li, and Osamu Tatebe

Interfacing SCMSWeb with Condor-G – A Joint PRAGMA-Condor Effort 570
Somsak Sriprayoonsakul, Putchong Uthayopas, Jysoo Lee, Cindy Zheng, Miron Livny, and Jaime Frey
PRIUS: An Educational Framework on PRAGMA Fostering Globally-Leading Researchers in Integrated Sciences 576
Susumu Date, Shoji Miyanaga, Kohei Ichikawa, Shinji Shimojo, Haruo Takemura, and Toru Fujiwara
Services Oriented Architecture for Managing Workflows of Avian Flu Grid 582
Luca Clementi, Sriram Krishnan, Wesley Goodman, Jingyuan Ren, Wilfred W. Li, Peter W. Arzberger, Guillaume Vareille, Sargis Dallakyan, and Michel F. Sanner
Grid Interoperability: An Experiment in Bridging Grid Islands 590
Blair Bethwaite, David Abramson, and Ashley Buckle

Workshop: 3rd International Workshop on Scientific Workflows and Business Workflow Standards in e-Science

Kairos: An Architecture for Securing Authorship and Temporal Information of Provenance Data in Grid-Enabled Workflow Management Systems 597
Luiz M.R. Gadelha Jr and Marta Mattoso
StrainInfo.net Web Services: Enabling Microbiologic Workflows Such as Phylogenetic Tree Building and Biomarker Comparison 603
Bert Verslyppe, Bram Slabbinck, Wim De Smet, Paul De Vos, Bernard De Baets, and Peter Dawyndt
Resource Provisioning Options for Large-Scale Scientific Workflows 608
Gideon Juve and Ewa Deelman
Build Grid Enabled Scientific Workflows Using gRAVI and Taverna 614
Kyle Chard, Cem Onyuksel, Wei Tan, Dinanath Sulakhe, Ravi Madduri, and Ian Foster
Lattice QCD Workflows: A Case Study 620
Luciano Piccoli, James B. Kowalkowski, James N. Simone, Xian-He Sun, Hui Jin, Donald J. Holmgren, Nirmal Seenu, and Amitoj G. Singh
Capturing Workflow Event Data for Monitoring, Performance Analysis, and Management of Scientific Workflows 626
Matthew D. Valerio, Satya S. Sahoo, Roger S. Barga, and Jared J. Jackson
A High-Level Distributed Execution Framework for Scientific Workflows 634
Jianwu Wang, Ilkay Altintas, Chad Berkley, Lucas Gilbert, and Matthew B. Jones
On the Use of Cloud Computing for Scientific Workflows 640
Christina Hoffa, Gaurang Mehta, Tim Freeman, Ewa Deelman, Kate Keahey, Bruce Berriman, and John Good
MRGIS: A MapReduce-Enabled High Performance Workflow System for GIS 646
Qichang Chen, Liqiang Wang, and Zongbo Shang

Workshop: eScience for Cheminformatics & Drug Discovery

An Automatic Drug Discovery Workflow Generation Tool Using Semantic Web Technologies 652
Xiao Dong and David Wild
SQMD: Architecture for Scalable, Distributed Database System Built on Virtual Private Servers 658
Kangseok Kim, Marlon E. Pierce, and Rajarshi Guha
DrugScreener-G: Towards an Integrated Environment for Grid-Enabled Large-Scale Virtual Screening and Drug Discovery 666
Jincheol B. Kim, Nguyen Dang Nhan, Sehoon Lee, Soonwook Hwang, and Vincent Breton

Workshop: Advances in High-Performance e-Science Middleware & Applications

An Adaptive XML Parser for Developing High-Performance Web Services 672
Wei Zhang and Robert A. van Engelen
DAGDA: Data Arrangement for the Grid and Distributed Applications 680
Eddy Caron, Frédéric Desprez, and Gaël Le Mahec
Analysis of Cache Performance for Processing XML-Based Application Data on Multi-core Processors 688
Rajdeep Bhowmik and Madhusudhan Govindaraju
Parallel Multidimensional Scaling Performance on Multicore Systems 695
Seung-Hee Bae
Coordinated Co-allocation Scheduling on Heterogeneous Clusters of SMPs 703
Ivan Rodero and Julita Corbalan
Resource Availability Prediction for Improved Grid Scheduling 711
Brent Rood and Michael J. Lewis

Workshop: Abstractions for Distributed Applications & Systems

Towards Computational Abstractions over a RESTful Architecture 719
David De Roure
Using Small Abstractions to Program Large Distributed Systems 723
Douglas Thain, Christopher Moretti, Hoang Bui, Li Yu, Nitesh Chawla, and Patrick Flynn

Workshop: Innovative & Collaborative Problem Solving Environments in Distributed Resources

The Problem Solving Environments of TeraGrid, Science Gateways, and the Intersection of the Two 725
Jim Basney, Stuart Martin, JP Navarro, Marlon Pierce, Tom Scavo, Leif Strand, Tom Uram, Nancy Wilkins-Diehr, Wenjun Wu, and Choonhan Youn

Jylab Meets Eclipse: Integrating PSEs with Multicomponent Platforms 735
Giorgos Kollias, Konstantinos Georgiou, and Efstratios Gallopoulos

Studies of Agent Composition Model of PSE-Bio Workflow 743
Jiang Xie, Yiwen Zhang, Wu Zhang, Guoyong Mao, and Jian Mei

e-Science Workbench: an Approach to Build Domain-Specific Problem Solving Environments 749
Dongsoo Han and Soonwook Hwang

A Distributed Linkage Method for a Large Amount of Event Data 756
Hiromichi Kobashi, Riichiro Take, and Shigeo Kawata

A Login Shell for Computing Grid 762
Xiaoning Wang, Jian Lin, Yongqiang Zou, and Li Zha

A Grid-Enabled Problem Solving Environment for Supporting Collaborative Aerodynamic Engineering Process 770
Junehawk Lee, Dukyun Nam, Soonwook Hwang, and Ok-hwan Byeon

Workshop: Adding Value to Data-Digital Repositories in eScience World

Synergies between Grid and Repository Technologies - A Methodical Mapping 778
Andreas Aschenbrenner, Tobias Blanke, and Mark Hedges

Rethinking Metadata Creation and Management in a Data-Driven Research World 782
Andrew Treloar and Ross Wilkinson

A Wiki for Collaboration and Publication in Research 790
Christoph von Hinten, Andreas Hense, and Matthias Razum

Author Index