

Table of Contents

I Computational Science Track

Session 1 - Problem Solving Environments

A Problem Solving Environment Based on Commodity Software 3
D.J. Lancaster, J.S. Reeve

DOVE: A Virtual Programming Environment for High Performance
Parallel Computing 12
H.D. Kim, S.H. Ryu, C.S. Jeong

Session 3 - Metacomputing

The Problems and the Solutions of the Metacomputing Experiment
in SC99 22
*S. Pickles, F. Costen, J. Brooke, E. Gabriel, M. Müller, M. Resch,
S. Ord*

Grid Computing on the Web Using the Globus Toolkit 32
G. Aloisio, M. Cafaro, P. Falabella, C. Kesselman, R. Williams

Data Futures in DISCWorld 41
H.A. James, K.A. Hawick

Session 6 - Partitioners / Load Balancing

Algorithms for Generic Tools in Parallel Numerical Simulation 51
D. Lecomber, M. Rudgyard

Dynamic Grid Adaption for Computational Magnetohydrodynamics 61
R. Keppens, M. Nool, P.A. Zegeling, J.P. Goedbloed

Parallelization of Irregular Problems Based on Hierarchical Domain
Representation 71
F. Baiardi, S. Chiti, P. Mori, L. Ricci

Dynamic Iterative Method for Fast Network Partitioning 81
C.S. Jeong, Y.M. Song, S.U. Jo

Session 9 - Numerical Parallel Algorithms

ParIC: A Family of Parallel Incomplete Cholesky Preconditioners 89
M. Magolu monga Made, H.A. van der Vorst

A Parallel Block Preconditioner Accelerated by Coarse Grid Correction . . . 99
C. Vuik, J. Frank

Towards an Implementation of a Multilevel ILU Preconditioner on
 Shared-Memory Computers 109
A. Meijster, F.W. Wubs

Session 11 - Numerical Parallel Algorithms

Application of the Jacobi–Davidson Method to Spectral Calculations in
 Magnetohydrodynamics 119
*A.J.C. Beliën, B. van der Holst, M. Nool, A. van der Ploeg,
 J.P. Goedbloed*

PLFG: A Highly Scalable Parallel Pseudo-random Number Generator for
 Monte Carlo Simulations 127
C.J.K. Tan, J.A. Rod Blais

*par*SOM: Using Parallelism to Overcome Memory Latency in Self-Organizing
 Neural Networks 136
Ph. Tomsich, A. Rauber, D. Merkl

II Web-Based Cooperative Applications Track

Session 2 - Virtual Enterprises / Virtual Laboratories

Towards an Execution System for Distributed Business Processes in a
 Virtual Enterprise 149
L.M. Camarinha-Matos, C. Pantoja-Lima

Towards a Multi-layer Architecture for Scientific Virtual Laboratories 163
*H. Afsarmanesh, A. Benabdelkader, E.C. Kaletas, C. Garita,
 L.O. Hertzberger*

Session 4 - Cooperation Coordination

Modelling Control Systems in an Event-Driven Coordination Language . . . 177
T.A. Limniotes, G.A. Papadopoulos

Ruling Agent Motion in Structured Environments 187
M. Cremonini, A. Omicini, F. Zambonelli

Dynamic Reconfiguration in Coordination Languages 197
G.A. Papadopoulos, F. Arbab

Session 7 - Advanced Web-Based Tools for Tele-working

Developing A Distributed Scalable Enterprise JavaBean Server.	207
<i>Y. Guo, P. Wendel</i>	
CFMS - A Collaborative File Management System on WWW	217
<i>S. Ruey-Kai, C. Ming-Chun, C. Yue-Shan, Y. Shyan-Ming, T. Jensen, H. Yao-Jin, L. Ming-Chih</i>	
Adding Flexibility in a Cooperative Workflow Execution Engine	227
<i>D. Grigori, H. Skaf-Molli, F. Charoy</i>	
A Web-Based Distributed Programming Environment	237
<i>K.F. Aoki, D.T. Lee</i>	

III Computer Science Track

Session 5 - Monitoring and Performance

Performance Analysis of Parallel N-Body Codes	249
<i>P. Spinnato, G.D. van Albada, P.M.A. Sloot</i>	
Interoperability Support in Distributed On-Line Monitoring Systems	261
<i>J. Trinitis, V. Sunderam, T. Ludwig, R. Wismüller</i>	
Using the SMiLE Monitoring Infrastructure to Detect and Lower the Inefficiency of Parallel Applications.	270
<i>J. Tao, W. Karl, M. Schulz</i>	

Session 8 - Monitoring and Performance

Run-Time Optimization Using Dynamic Performance Prediction	280
<i>A.M. Alkindi, D.J. Kerbyson, E. Papaefstathiou, G.R. Nudd</i>	
Skel-BSP: Performance Portability for Skeletal Programming	290
<i>A. Zavanella</i>	
Self-Tuning Parallelism	300
<i>O. Werner-Kytölä, W.F. Tichy</i>	
A Novel Distributed Algorithm for High-Throughput and Scalable Gossiping	313
<i>V. De Florio, G. Deconinck, R. Lauwereins</i>	

Session 13 - Low-Level Algorithms

Parallel Access to Persistent Multidimensional Arrays from HPF Applications Using <i>Panda</i>	323
<i>P. Brezany, P. Czerwinski, A. Swietanowski, M. Winslett</i>	

High Level Software Synthesis of Affine Iterative Algorithms onto Parallel Architectures 333
A. Marongiu, P. Palazzari, L. Cinque, F. Mastronardo

Run-Time Support to Register Allocation for Loop Parallelization of Image Processing Programs 343
N. Zingirian, M. Maresca

A Hardware Scheme for Data Prefetching 353
S. Manoharan, K. See-Mu

Session 15 - Java in HPC

A Java-Based Parallel Programming Support Environment 363
K.A. Hawick, H.A. James

A Versatile Support for Binding Native Code to Java 373
M. Bubak, D. Kurzyniec, P. Luszczek

Task Farm Computations in Java 385
M. Danelutto

Session 16 - Clusters

Simulating Job Scheduling for Clusters of Workstations 395
J. Santoso, G.D. van Albada, B.A.A. Nazief, P.M.A. Sloot

A Compact, Thread-Safe Communication Library for Efficient Cluster Computing 407
M. Danelutto, C. Pucci

EPOS and Myrinet: Effective Communication Support for Parallel Applications Running on Clusters of Commodity Workstation 417
A.A. Fröhlich, G.P. Tientcheu, W. Schröder-Preikschat

Distributed Parallel Query Processing on Networks of Workstations 427
C. Soleimany, S.P. Dandamudi

IV Industrial and End-User Applications Track

Session 10 - Parallelisation of Industrial Applications

High Scalability of Parallel PAM-CRASH with a New Contact Search Algorithm 439
J. Clinckemaillie, H.G. Galbas, O. Kolp, C.A. Thole, S. Vlachoutsis

Large-Scale Parallel Wave Propagation Analysis by GeoFEM 445
K. Garatani, H. Nakamura, H. Okuda, G. Yagawa

Explicit Schemes Applied to Aeroacoustic Simulations: The RADIOSS-CFD System	454
<i>D. Nicolopoulos, A. Dominguez</i>	

Session 12 - Data Analysis and Presentation

Creating DEMO Presentations on the Base of Visualization Model	460
<i>E.V. Zudilova, D.P. Shamonin</i>	

Very Large Scale Vehicle Routing with Time Windows and Stochastic Demand Using Genetic Algorithms with Parallel Fitness Evaluation	467
<i>M. Protonotarios, G. Mourkousis, I. Vyridis, T. Varvarigou</i>	

Extracting Business Benefit from Operational Data	477
<i>T.M. Sloan, P.J. Graham, K. Smyllie, A.D. Lloyd</i>	

Session 14 - Miscellaneous Applications

Considerations for Scalable CAE on the SGI ccNUMA Architecture	487
<i>S. Posey, C. Liao, M. Kremenetsky</i>	

An Automated Benchmarking Toolset	497
<i>M. Courson, A. Mink, G. Marçais, B. Traverse</i>	

Evaluation of an RCube-Based Switch Using a Real World Application ...	507
<i>E.C. Kaletas, A.W. van Halderen, F. van der Linden, H. Afsarmanesh, L.O. Hertzberger</i>	

MMSRS - Multimedia Storage and Retrieval System for a Distributed Medical Information System	517
<i>R. Słota, H. Kosch, D. Nikolow, M. Pogoda, K. Bredler, S. Podlipnig</i>	

V Posters

Web-Based Cooperative Applications

Dynamically Transcoding Data Quality for Faster Web Access	527
<i>C. Chi-Huing, L. Xiang, A. Lim</i>	

Easy Teach & Learn ^(R) : A Web-Based Adaptive Middleware for Creating Virtual Classrooms	531
<i>T. Walter, L. Ruf, B. Plattner</i>	

Industrial and End-User Applications

A Beowulf Cluster for Computational Chemistry	535
<i>K.A. Hawick, D.A. Grove, P.D. Coddington, H.A. James, M.A. Buntine</i>	

The APEmille Project	539
<i>E. Panizzi, G. Sacco</i>	
A Distributed Medical Information System for Multimedia Data - The First Year's Experience of the PARMED Project	543
<i>H. Kosch, R. Słota, L. Böszörményi, J. Kitowski, J. Otfinowski, P. Wójcik</i>	
Airport Management Database in a Simulation Environment	547
<i>A. Pasquarelli, T. Hruz</i>	
Different Strategies to Develop Distributed Object Systems at University of La Laguna	551
<i>A. Estévez, F.H. Priano, M. Pérez, J.A. González, D.G. Morales, J.L. Roda</i>	
DESIREE: DEcision Support System for Inuandation Risk Evaluation and Emergencies Management	555
<i>G. Adorni</i>	
Database System for Large-Scale Simulations with Particle Methods	558
<i>D. Kruk, J. Kitowski</i>	
Computational Science	
Script Wrapper for Software Integration Systems	560
<i>J. Fischer, A. Schreiber, M. Strietzel</i>	
Implementation of Nested Grid Scheme for Global Magnetohydrodynamic Simulations of Astrophysical Rotating Plasmas	564
<i>T. Kuwabara, R. Matsumoto, S. Miyaji, K. Nakamura</i>	
Parallel Multi-grid Algorithm with Virtual Boundary Forecast Domain Decomposition Method for Solving Non-linear Heat Transfer Equation	568
<i>G. Qingping, Y. Paker, Z. Shesheng, D. Parkinson, W. Jialin</i>	
High Performance Computing on Boundary Element Simulations	572
<i>J.M. Cela, A. Julià</i>	
Study of Parallelization of the Training for Automatic Speech Recognition	576
<i>E.M. Daoudi, A. Meziane, Y.O. Mohamed El Hadj</i>	
Parallelization of Image Compression on Distributed Memory Architecture	580
<i>E.M. Daoudi, E.M. Jaâra, N. Cherif</i>	
Parallel DSMC on Shared and Hybrid Memory Multiprocessor Computers	584
<i>G.O. Khanlarov, G.A. Lukianov, D.Yu. Malashonok, V.V Zakharov</i>	

Population Growth in the Penna Model for Migrating Population	588
<i>A.Z. Maksymowicz, P. Gronek, W. Alda, M.S. Magdoń-Maksymowicz, M. Kopeć, A. Dydejczyk</i>	

Use of the Internet for Distributed Computing of Quantum Evolution	592
<i>A.V. Bogdanov, A.S. Gevorkyan, A.G. Grigoryan, E.N. Stankova</i>	

Computer Science

Debugging MPI Programs with Array Visualization	597
<i>D. Kranzmueller, R. Kobler, R. Koppler, J. Volkert</i>	

An Analytical Model for a Class of Architectures under Master-Slave Paradigm	601
<i>Y. Yalçınkaya, T. Steihaug</i>	

Dynamic Resource Discovery through MatchMaking	605
<i>O.F. Rana</i>	

A New Approach to the Design of High Performance Multiple Disk Subsystems: Dynamic Load Balancing Schemes	610
<i>A.I. Vakali, G.I. Papadimitriou, A.S. Pomportsis</i>	

Embarrassingly Parallel Applications on a Java Cluster	614
<i>B. Vinter</i>	

A Revised Implicit Locking Scheme in Object-Oriented Database Systems .	618
<i>W. Jun, K. Kim</i>	

Active Agents Programming in HARNESS	622
<i>M. Migliardi, V. Sunderam</i>	

VI Workshops

LAWRA Workshop

LAWRA Workshop: Linear Algebra with Recursive Algorithms: http://lawra.uni-c.dk/lawra/	629
<i>F. Gustavson, J. Waśniewski</i>	

Java in HPC Workshop

Communicating Mobile Active Objects in Java	633
<i>F. Baude, D. Caromel, F. Huet, J. Vayssière</i>	

A Service-Based Agent Framework for Distributed Symbolic Computation	644
<i>R.D. Schimkat, W. Blochinger, C. Sinz, M. Friedrich, W. Küchlin</i>	

Performance Analysis of Java Using Petri Nets 657
O.F. Rana, M.S. Shields

Cluster Computing Workshop

A Framework for Exploiting Object Paralellism in Distributed Systems . . . 668
W. Chen, M.T. Yong

Cluster SMP Nodes with the ATOLL Network: A Look into the Future of
System Area Networks 678
*L. Rzymianowicz, M. Waack, U. Brüning, M. Fischer, J. Kluge,
P. Schulz*

An Architecture for Using Multiple Communication Devices in a
MPI Library 688
H. Pedroso, J. Gabriel Silva

Results of the One-Year Cluster Pilot Project 698
*K. Koski, J. Heikonen, J. Miettinen, H. Niemi, J. Ruokolainen,
P. Tolvanen, J. Mäki, J. Rahola*

Clusters and Grids for Distributed and Parallel Knowledge Discovery 708
M. Cannataro

Author Index 717