



IEEE Technical Committee on Scalable Computing (TCSC)

ANNUAL REPORT – 2007

- **Prepared for:** The IEEE Computer Society and TCSC Members
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Contents

Executive Summary	ii
1. Introduction	1
1.1 About TCSC	1
1.2 TSCS Guiding Principles	1
2. TCSC Organizational Structure	3
2.1 TCSC Executive Committee	3
2.2 TCSC Advisory Board	3
3. TCSC Conferences	3
3.1 TCSC Core Conferences (with major or full sponsorship)	4
3.2 TCSC Associated Conferences (with partial sponsorship)	4
3.3 TCSC/Elsevier Best Paper Awards	4
4. TCSC Cyberspace	5
5. TCSC Young Researchers Forum	6
6. TCSC Students Travel Support Program	7
7. Technical Areas and Coordinators	9
8. Regional Forums and Coordinators	11
9. Distinguished TCSC Volunteers	12
10. Two New Recent Programs	15
10.1 IEEE International Scalable Computing Challenge	15
10.2 IEEE Medal for Excellence in Scalable Computing	16
11. Conclusions and Future Directions	16
Appendix: CCGrid 2007 Conference Report	18



Executive Summary

This has been a great year for the IEEE Computer Society Technical Committee on Scalable Computing (TCSC). We were able to strengthen existing programs and services in addition to creating new and innovative programs for the benefit of our community. The key achievements of TCSC in 2007 are:

- Organisation of well attended and highly successful conferences both technically and financially. For example, CCGrid 2007 held in Rio, Brazil has attracted 330 participants, a number greater than any other CCGrid event in its seven-year history. In addition, the conference offered first class service to all participants and at the same time able to generate a profit of over \$20,000 for the Society.
- Rapid growth of Young Researcher Forum with creation of a resource centre and events such as Doctoral Symposium. All PhD students whose papers were accepted for TCSC Doctoral Symposium were awarded TCSC travel support scholarships. On a related matter, one of TCSC's conferences (Supercomputing Conference) has launched IEEE/ACM HPC Fellowship for research students.
- Strong participation of industries in TCSC conferences and community activities. For example, CCGrid 2007 and e-Science 2007 have received substantial financial support from various companies such as Google, Microsoft, HP, IBM, Intel, NEC, SGI, Sun and their active participation in industrial track by featuring presentations from their best and brightest researchers.
- Over 40 PhD students from all over the world have received TCSC sponsored travel support/scholarship to attend our key conferences such as CCGrid 2007, Cluster 2007, Grid 2007, and e-Science 2007.
- TCSC events have worked with Govt. bodies from host countries and raised substantial funding to support participation of researchers from developing countries by offering them subsidized registration fees.
- Several Technical and Regional programs and their Resource Centres have been strengthened with addition of new content to their websites. As a result, it is fair to say that TCSC is the leader amongst Technical Committees within the Computer Society in offering topmost cyber services to its members.
- TCSC has proactively recognised its 29 distinguished volunteers by nominating for the Service Awards and the Computer Society has accepted them.
- To ignite the minds of young researchers and recognise a prominent researcher and volunteer annually, TCSC has recently initiated two new programs: (i) *IEEE International Scalable Computing Challenge* and (ii) *IEEE Medal for Excellence in Scalable Computing*.

As a result of the above achievements in 2007, TCSC was able to actively expand its volunteers' base and membership, and positively impact the community.



1. Introduction

1.1 About TCSC

The IEEE Technical Committee on Scalable Computing (TCSC) addresses theoretical and experimental aspects of designing, developing, and evaluating scalable network computing systems, especially clusters and grids, and their applications. Specific topics of interest include cluster and grid interconnection networks, middleware, single-system image, resource and scheduling management policies, distributed programming environments, principles of scalable and reliable software engineering, and high-performance and high-availability computing applications. The TCSC sponsors workshops and conferences on these and related topics, and hosts the five annual flagship events: International Conference on Cluster Computing (Cluster'XY), International Super-Computing Conference (SC'XY), International Symposium on Cluster Computing and the Grid (CCGrid'XY), International Conference on Grid Computing (Grid'XY) and International Conference on E-Science and Grid Computing (E-Science'XY) in addition to co-sponsoring other related events.

1.2 TSCS Guiding Principles

To face the challenges of the new millennium and to benefit from the opportunities emerging from it, the Technical Committee on Scalable Computing (TCSC) needs to provide a dynamic forum that enables and promotes active interaction and networking between researchers and practitioners from academia, industry, and government. The key objectives of the forum are to provide various avenues for:

- (a) creating, sharing and exchanging knowledge and ideas,
- (b) building links between researchers from academia with practitioners from industry,
- (c) developing new collaborative activities and projects between members,
- (d) guiding young and emerging researchers, and
- (e) promoting standards and educational programs at regional and international levels.

To realize these objectives effectively, and to assist our members in maintaining their competitive edge, the TCSC leadership has emphasized, initiated, and promoted the following key concepts and programs as guiding principles:

1. Technical forums on emerging issues in scalable computing (SC)
2. Cost-effective and high-quality conferences hosted by TCSC— for example, TCSC promoted the concept of treating student attendees as first class participants by offering them services similar to those generally offered to full-fee paying attendees. This is achieved through industrial and government sponsorships and grants
3. Initiated and hosted industry forums at TCSC conferences to develop better links between industry and academia



4. Initiate a mentoring program for young researchers by establishing a body of international experts who are willing to volunteer their time and energy for guiding or commenting on research proposals and projects
5. Promotion of educational programs by:
 - Encouraging the sharing of thoughts on teaching and teaching material
 - Establishing an active book donation program
 - Exploring the inclusion of emerging topics within SC in IEEE-CS/ACM Curriculum guidelines
6. Organization of doctoral forums:
 - To encourage students to pose questions and discuss pertinent issues with fellow doctoral students, and
 - To maintain information links that provide direct access to a variety of resources to assist in their research
7. Establishment of regional TCSC forums to develop stronger links between regional and international communities
8. Promotion of collaborative projects with sister TCs within the Computer Society and outside, such as the ACM
9. Establishment of effective and state-of-the-art TCSC web portal, and regularly publishing a TCSC newsletter with interesting technical stories and articles
10. Active participation in the Society's Technical Activities Board (TAB) and ensure that the needs of our members are recognized and met, and
11. Actively seek new volunteers and recognize their contribution by nominating them for IEEE service awards.

This report presents the activities undertaken and planned in the near future by the TCSC.



2. TCSC Organizational Structure

TCSC activities are managed by members of the Executive Committee and a large number of volunteers especially those involved in TCSC events (conferences and associated workshops).

2.1 TCSC Executive Committee

- Chair: Dr. Rajkumar Buyya, The University of Melbourne, Australia
- Vice Chair: Dr. Manish Parashar, Rutgers: State University of New Jersey, USA.
- Cyber Chair: Frank Sommers, University of Southern California, Los Angeles, USA
- Conference Coordinator: Dr. Laurence Yang, St. Francis Xavier University, Canada
- TCSC Young Researchers Forum Coordinators: Markus Lorch (IBM, Germany) and Srikumar Venugopal (University of Melbourne, Australia)
- TCSC Newsletter Coordinator: Vanish Talwar, HP Labs, Palo Alto (California), USA
- Technical Areas Coordinators: <see Technical Areas Section>
- Regional Forums Coordinators: <see Regional Forum Section>

2.2 TCSC Advisory Board

- Dr. Jack Dongarra, ORNL and the University of Tennessee, USA
- Dr. Kai Li, Princeton University, USA
- Dr. Wolfgang Gentzsch, D-Grid, Germany
- Dr. Manish Parashar, Rutgers: The State University of New Jersey, USA
- Dr. Sitharama Iyengar, Louisiana State University, USA
- Dr. Rajkumar Buyya, The University of Melbourne, Australia (coordinator)
- Dr. Lalit Patnaik, Indian Institute of Science, India
- Dr. Greg Pfister, IBM (retired), USA.
- Dr. Craig Lee, The Aerospace Corporation and Open Grid Forum, USA
- Dr. Ron Perrott, Queen's University of Belfast, UK
- Dr. William Kramer, Lawrence Berkeley National Laboratory, USA

3. TCSC Conferences

TCSC has actively supported its regular/core conferences and offered cooperation to related conferences. Key features of TCSC conferences are:

- Participation of researchers and user communities from academia, industry, and govt. labs
- Comprehensive and quality technical program featuring regular peer-reviewed papers, keynotes, tutorials, workshops on hot topics, poster papers, panels, technical exhibits, and industry tracks.
- Strong financial support from industry and regional governments, which helped in offering subsidized registration fee for students. TCSC considers students as its future leaders and ensures that students are fully integrated into TCSC-sponsored



conferences as first class participants by offering the same services as full-fee paying participants receive.

- Served as venues for establishing and promoting collaborative projects between researchers from different national and international organisations.

3.1 TCSC Core Conferences (with major or full sponsorship)

- CCGrid 2007: 7th IEEE International Symposium on Cluster Computing and the Grid, May 14-17, 2007, Rio, Brazil
- Cluster 2007: 9th IEEE International Conference on Cluster Computing, September 17-21, 2007, Austin, Texas, USA
- Grid 2007: 8th IEEE International Conference on Grid Computing, September 19-21, 2007, Austin, Texas, USA
- SC 2007: IEEE/ACM Supercomputing Conference, November 10-16, 2006, Reno, Nevada, USA
- e-Science 2007: 3rd IEEE International Conference on e-Science and Grid Computing, Dec. 10-13, 2007, Bangalore, India

3.2 TCSC Associated Conferences (with partial sponsorship)

- 19th International Symposium on Computer Architecture and High Performance Computing (SBAC-PAD 2007), October 24-27, 2007, Serra Azul Hotel, Gramado, RS, Brazil.

3.3 TCSC/Elsevier Best Paper Awards

All the above conferences are well attended and met sponsorship expectations (exceeded in most cases) of the IEEE CS and TCSC. All conferences generated positive financial outcomes.

The Future Generation Computing Systems (FGCS) Journal, published by the Elsevier Press, has established a program that sponsors best paper awards for conferences in the area of Grid Computing technologies and its applications. They have agreed to offer annual awards for the best two student papers (cash and certificate) presented at the following two TCSC conferences:

- CCGrid: IEEE International Symposium on Cluster Computing and Grid
- E-Science: International Conference on E-Science and Grid Computing

These awards clearly recognize the quality of TCSC conferences and value what they offer to our broader communities.

CCGrid 2007 award (a plaque and a small cash) sponsored by Elsevier has been presented to late Prof. Ken Kennedy and his Rice University team for their sustained contribution to CCGrid since its foundation in 2001.

To illustrate how TCSC events are organised, managed, and made successful along with enthusiasm of volunteers, I have enclosed a report on CCGrid 2007 conference



written by Dr. Bruno Schulze, LNCC (Brazil), and Dr. Omer Rana, Cardiff University (UK) in Appendix at the end.

4. TCSC Cyberspace

The TCSC maintains an active presence on the web with a public website available at <http://www.ieeetcsc.org>. The website is managed using Drupal content-management system that allows both TCSC members and the general public to contribute content, comment on articles, post on discussion forums, and to subscribe to the TCSC's email distribution list.

■ **Figure 1** A snapshot of TCSC web portal



The TCSC website on average received about 40,000 page views a month. The TCSC's subscription mailing list, used mainly for open discussion and conference announcements, currently has 553 subscribers. In addition to discussions, occasional articles, and announcements, the TCSC website hosts technical area sections, focusing on sub-fields inside scalable computing as well as geographic interest groups within the TCSC community.



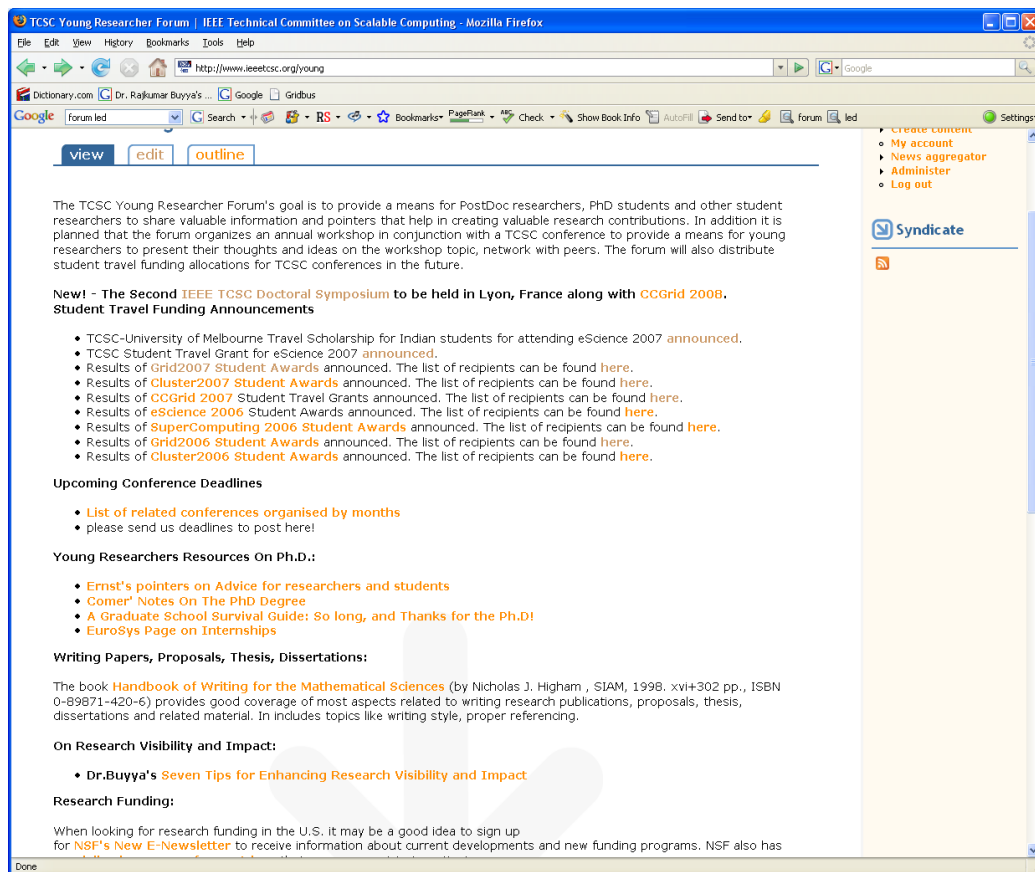
In 2007, TCSC expanded its online publishing efforts by making it easier for TCSC members, as well as the broader community of practitioners, to post content on the site, and to participate in online activities, such as the discussion forums. The online activities have grown by increased involvement of TCSC volunteers in the editing activities of materials posted on the site and related to a volunteer's field of expertise.

TCSC also publishes web-based biannual newsletters containing short technical articles. In 2007, the first newsletter was released in the month of May and 2nd released in the month of November.

5. TCSC Young Researchers Forum

The TCSC Young Researchers Forum's goal is to provide a means for PostDoc researchers, PhD students and other student researchers to share valuable information and pointers that help in creating important research contributions. In addition, it is planned that the forum organizes an annual workshop in conjunction with a TCSC conference to provide a means for young researchers to present their thoughts and ideas on the workshop topic and to network with peers. The forum actively engaged with student travel funding allocations for TCSC conferences.

■ **Figure 2** A snapshot of TCSC Young Researchers Forum website





The forum led by:

- Markus Lorch, IBM, Germany
- Srikumar Venugopal, University of Melbourne, Australia

has organised a Doctoral Symposium along with the CCGrid 2007 conference, and offered partial financial support to selected students. The Doctoral Symposium was well attended by not only students, but many senior colleagues. The event opened with an opening speech by TCSC chair followed by invited lecture on “How to Write Quality Papers and Publish them in High Impact Journals” by Prof. Peter Sloot, Editor-In-Chief of *Future Generation Computing Systems Journal*, from the University of Amsterdam, The Netherlands.

6. TCSC Students Travel Support Program

TCSC has been actively supporting participation of students in its conferences by offering them highly discounted registration fee and services on par with regular attendees. In addition, several students are offered travel support to enable them to attend TCSC conferences. TCSC expects all applicants to setup a web-based research literature resource centers and directories as this ensures that TCSC travel support recipients are able to engage in enhancing Resource Centre developed by the Young Researchers Forum.

From its 2007 budget, TCSC offered partial travel reimbursement for several students (competitively selected) to enable them to attend its core conferences. TCSC offered a \$5000 travel fund for each of the following conferences: CCGrid 2007, Cluster 2007, Grid 2007, e-Science 2007, and Doctoral Symposium. Some of the students who received financial support are actively participating in TCSC activities. The details of recipients including the amount granted are included below.

▪ **Table 1** Cluster 2007 Conference Students

Name	University	Website	Amount
Florina Ciorba	NTUA, Greece	http://www.cslab.ece.ntua.gr/~cflorina/	US\$1000
Raju Gottumukkala	LaTech, USA	http://www2.latech.edu/~nrg003/	US\$500
Wei Huang	Ohio State, USA	http://www.cse.ohio-state.edu/~huanwei/	US\$500
Matthew Koop	Ohio State, USA	http://www.cse.ohio-state.edu/~koop/research.html	US\$500
Akihiro Nomura	U Tokyo, Japan	http://www.il.is.s.u-tokyo.ac.jp/~s_fox/	US\$1000
Karthikeyan Vaidyanathan	Ohio State, USA	http://www.cse.ohio-state.edu/~vaidyana/	US\$500
Jianhui Yue	U Maine, USA	http://www.eece.maine.edu/~jyue/projects/memEnergy/energy.htm	US\$500
Reza Zamani	Queen's U, Canada	http://qmlink.queensu.ca/~2rz/	US\$500

■ **Table 2** Grid 2007 Conference Students

Name	University	Website	Amount
Mehmet Balman	LSU, USA	http://www.cct.lsu.edu/~balman	US\$500
Viraj Bhat	Rutgers, USA	http://www.caip.rutgers.edu/~virajb/researchhighlights.html	US\$500
Howie Huang	U. Virginia, USA	http://www.cs.virginia.edu/~hh4z/	US\$500
Alexandru Iosup	TU Delft, Netherlands	http://www.pds.ewi.tudelft.nl/~iosup/	US\$1000
Andres Quiroz	Rutgers, USA	http://www.caip.rutgers.edu/~aquiroz/index_archivos/Page334.html	US\$500
Brent Rood	Binghamton, USA	http://cs.binghamton.edu/~brood/	US\$500
Aobing Sun	Huazhong University of Science and Technology, China	http://grid.hust.edu.cn/ImageGrid/sunaobing	US\$1000

■ **Table 3** CCGrid 2007 Conference Students

Name	University	Website	Amount
Michael Klemm	University of Erlangen-Nuremberg, Germany	http://www2.cs.fau.de/Research/Projects/REMO	US\$400
Marco Netto	University of Melbourne, Australia	http://www.cs.mu.oz.au/~netto/research.html	US\$450
Tatsuhiko Chiba	Tokyo Institute of Technology, Japan	http://matsu-www.is.titech.ac.jp/Members/chiba_t/tatsuhiko-chiba	US\$400
Lei Chai	Ohio State University, USA	http://www.cse.ohio-state.edu/~chail/research.html	US\$400
Simon Caton	Cardiff University, UK	http://beryl.cs.cf.ac.uk/Web	US\$400
Jing Tian	Nanyang Technological University, Singapore	http://www.ntu.edu.sg/home5/pg05061499	US\$350
Yun Huang	University of California, Irvine, USA	http://mapgrid.ics.uci.edu/	US\$300
Lior Amar	Hebrew University, Israel	http://www.cs.huji.ac.il/~lior/	US\$300
Javier Echaiz	Universidad Nacional de Sur, Argentina	http://cs.uns.edu.ar/~jechaiz	US\$250
Jie Yin	Tsinghua University, China	http://tcs.cs.tsinghua.edu.cn/YinJ	US\$300



■ **Table 4** TCSC Doctoral Symposium Students

Name	University	Website	Amount
Hui Li	Leiden University, Netherlands	http://www.liacs.nl/~hli/research.htm	US\$800
Xun Luo	University of Illinois at Chicago, USA	http://www.cs.uic.edu/~xluo/research.html	US\$600
Deise Saccol	UFRGS, Brazil	http://www.inf.ufrgs.br/~deise/	US\$300
Al-Mukaddim Pathan	University of Melbourne, Australia	http://www.cs.mu.oz.au/~apathan/CDNs.html	US\$800
Justin Wozniak	Notre Dame University, USA	http://www.nd.edu/~jwozniak/	US\$600
Evgueni Dodonov	University of São Paulo, Brazil	http://eugeni.dodonov.net/	US\$300

■ **Table 5** e-Science 2007 Conference Students

Name	University	Website	Amount
Viraj Bhat	Rutgers University, USA	http://www.caip.rutgers.edu/~virajb	\$800
Im-Young Jung	Seoul National University, South Korea	https://dcslab.snu.ac.kr/~iyjung/	\$800
Magno Queiroz	Federal University Of Campina Grande, Brazil	http://www.gmf.ufcg.edu.br/~magnojs	\$1000
Rajeev Ranjan	University of Melbourne, Australia	http://www.cs.mu.oz.au/~rranjan	\$800
Anthony Sulistio	University of Melbourne, Australia	http://www.csse.unimelb.edu.au/~anthony	\$800

TCSC jointly with the University of Melbourne allocated \$5000 of its sponsorship for e-Science 2007 conference to enable Indian-based students to attend the conference. The support is aimed at offering complimentary registration, travel, and accommodation. In addition, TCSC has also offered its own studentship for international students.

7. Technical Areas and Coordinators

TCSC has actively engaged in serving technical communities, and has become a focal point for various topics in the scalable computing area. Each technical topic is managed and coordinated by volunteers indicated below. Each area has established its own



Technical Resource Center (TRC), which is basically a web portal providing introductory information on the topic, listing various research challenges and links to major R&D projects around the world in its sub areas. This is helping us to make both the TCSC and those projects (1) gain global visibility and (2) opportunity for researchers to network easily. In addition, it provides opportunity for young researchers and industries interested in that topic to communicate with technical area coordinators, which in turn has resulted in collaboration.

■ **Table 5** TCSC Technical Areas and Coordinators

Technical Area	Coordinator
Network Technologies	Rasit Eskicioglu, University of Manitoba, Canada
Sensor Networks	Xiaolin (Andy) Li, Oklahoma State University, USA
Single System Image Systems	Toni Cortes, Universitat Politècnica de Catalunya, Spain
High Availability Systems	Ira Pramanick, Sun Microsystems, USA
Security and Reliability of Scalable Systems	Bin Xiao, Hong Kong Polytechnic University, Hong Kong
Autonomic Management of Scalable Computing Systems	Yuanshun Dai, Purdue University, USA
Scalable Storage and File Systems	Prof. Jesús Carretero, Universidad Carlos III de Madrid, Spain
Distributed Shared Memory	Greg Byrd, North Carolina State University, Raleigh, USA
Workflow Management in Scalable Computing Environments	Jinjun Chen, Swinburne University of Technology, Australia
Software Engineering for Scalable Systems	Peter Luksch, University of Rostock, Germany
Performance Evaluation: Benchmarking	Alex Vrenios, Distributed Systems Research Lab, LLC Phoenix, Arizona USA
Programming Environments	Rosa Badia, Barcelona Supercomputing Centre/Universitat Politècnica de Catalunya, Spain
Algorithms and Applications	Ruppa Thulasiram and Parimala Thulasiraman, University of Manitoba, Winnipeg, Canada
Scientific Computing	Padma Raghavan, Pennsylvania State University, USA
Content Management and Delivery Networks	Athena Vakali, Aristotle University of Thessaloniki, Greece
Bioinformatics on Scalable Systems	Chun-Hsi Huang, University of Connecticut, USA
Education	Barry Wilkinson, UNCC, USA
Open Source Platforms and Middleware	Carlo Daffara, Conecta srl, Italy

There are many professional opportunities for TCSC technical area coordinators. They include (1) membership in the TCSC Executive Committee (2) eligible to receive IEEE service awards (3) opportunity to attend IEEE CS TAB Board meetings (4) leadership opportunities in TCSC sponsored conferences, e.g., Program Vice Chair for their technical topic.



8. Regional Forums and Coordinators

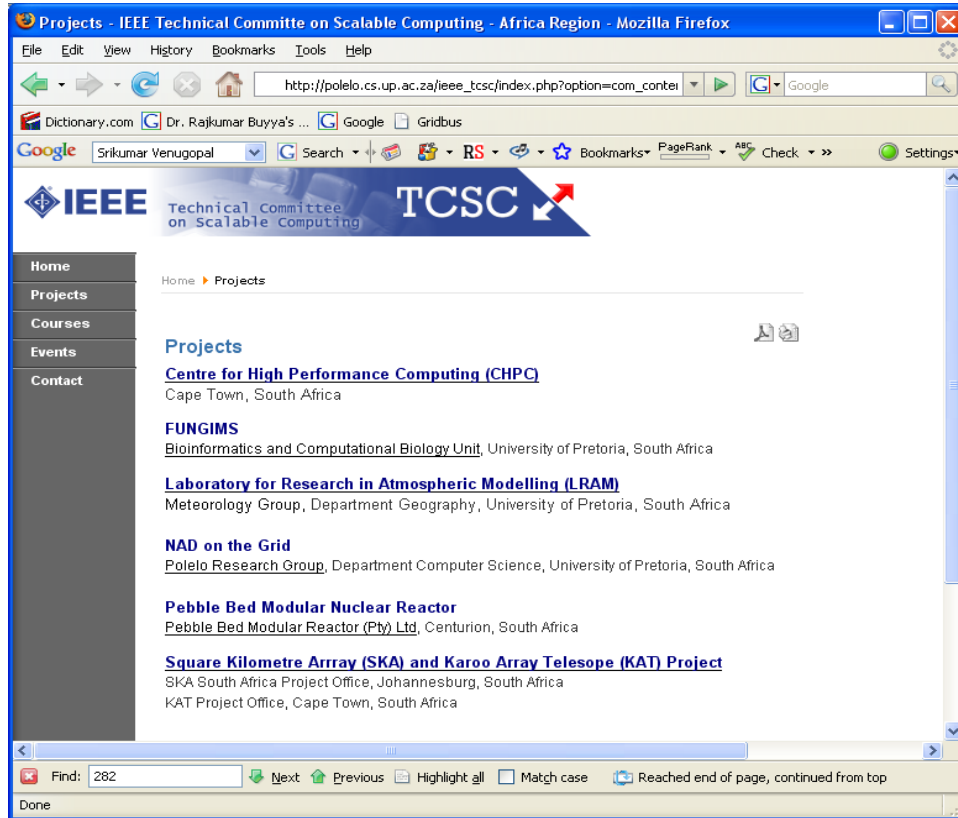
TFCC has regional coordinators in all parts of the world, and they are actively helping in the establishment of regional activities including the creation of regional web sites. Each regional forum maintains its own Technical Resource Centre containing pointer to projects/activities happening in TCSC areas of interest in their region. These regional resource centers (1) assist regional projects to gain global visibility and (2) provide opportunity for global researchers to connect themselves to regional activities. In addition, the TCSC has offered to sponsor regional activities such as Technical Competitions for Students, and sponsored prizes. TCSC encourages hosting of such competitions along with conferences held in their country/region. TCSC aims to sponsor winning team members to attend one of the TCSC sponsored conferences listed at <http://www.ieeetcsc.org/conferences.html>.

■ **Table 6** TCSC Regions and Coordinators

Region	Coordinator
Australia	Paul Coddington, University of Adelaide, Adelaide
Africa	Serena Coetzee, University of Pretoria, South Africa
China	Hai Jin, HUST, China
Europe	Beniamino Di Martino and Salvatore Venticinque Seconda Universita' di Napoli, Italy
Hong Kong	Cho-Li Wang, Hong Kong University, HK
India	Srigurunath Chakravarthi, MPI Software Technology India, Bangalore
Japan	Yutaka Ishikawa, University of Tokyo
Middle-East	Shahriar Shahhoseini, Iran University of Science and Technology, Tehran
South America	Bruno Schulze, Laboratório Nacional de Computação Científica, Brazil and Vinod Rebello, Universidade Federal Fluminense, Brazil
Thailand	Putchong Uthayopas, Kasetsart University, Bangkok
Taiwan	Chung-Ta King, National Tsing Hua University, Hsinchu
North America	Daniel S. Katz, NASA Jet Propulsion Lab., California Institute of Technology, USA



■ **Figure 3** A snapshot of TCSC Africa Region website



9. Distinguished TCSC Volunteers

The life blood of TCSC is its volunteers. Most TCSC core activities (such as conferences, technical forums, young researcher forums, managing TCSC student travel scholarship) are carried out by volunteers who dedicate their significant time and effort for the benefit of our community. Please browse through TCSC website at <http://www.ieeetcsc.org/> to get the firsthand feel of volunteers services in action.

This year, TCSC made every effort to recognise its key volunteers for their unique and sustained services especially over a period of time and for making TCSC as one of the most successful Technical Committees with the IEEE Computer Society in many forms, technically, financially, & socially. The following volunteers have been nominated for the IEEE Computer Society Service Awards and accordingly the Society has agreed to recognise them:

■ **Table 7** Recipients of TCSC nominated IEEE Computer Society Awards

Recipient	Citation
Dr. Bruno Schulze,	For outstanding services towards the organization of the 7th IEEE



Recipient	Citation
Laboratório Nacional de Computação Científica-LNCC, Brazil	International Symposium on Cluster Computing and the Grid (CCGrid 2007) sponsored by the IEEE Computer Society Technical Committee on Scalable Computing.
Dr. Vanish Talwar, HP Labs, USA	For outstanding services to the IEEE Computer Society's Technical Committee on Scalable Computing (TCSC) as Editor of its Newsletter.
Dr. Craig Lee, Aerospace Corporation, USA	For outstanding services to the IEEE Computer Society's Technical Committee on Scalable Computing (TCSC) as Chair of the Steering Committee of TCSC Sponsored Grid Conference (2001-2007) and active member of the CCGrid Symposium since its foundation in 2001.
Dr. Markus Lorch, IBM, Germany	For outstanding services to the IEEE Computer Society's Technical Committee on Scalable Computing (TCSC) as Coordinator of its Young Researcher Forum.
Dr. Srikumar Venugopal, University of Melbourne, Australia	For outstanding services to the IEEE Computer Society's Technical Committee on Scalable Computing (TCSC) as Coordinator of its Young Researcher Forum.
Dr. Mark Baker, University of Reading, UK	For outstanding and sustained services to the IEEE Computer Society's Technical Committee on Scalable Computing (TCSC) as Chair of the Steering Committee of TCSC Sponsored International Conference on Cluster Computing.
Dr. Cho-Li Wang, University of Hongkong, Hongkong	For outstanding and sustained services to the IEEE Computer Society's Technical Committee on Scalable Computing (TCSC) activities in various roles including serving as a regional coordinator and chairing TCSC sponsored 5th IEEE International Conference on Cluster Computing.
Dr. Daniel S Katz, Louisiana State University, USA	For outstanding and sustained services to the IEEE Computer Society's Technical Committee on Scalable Computing (TCSC) sponsored International Conference on Cluster Computing since its foundation in 1999.
Dr. Toni Cortes, Universitat Politècnica de Catalunya, Spain	For outstanding and sustained services to the IEEE Computer Society's Technical Committee on Scalable Computing (TCSC) activities in various roles including serving as a coordinator for TCSC Single System Image area and chairing TCSC sponsored 8th IEEE International Conference on Cluster Computing.
Dr. Hadi Shahriar Shahhoseini, Iran University of Science and Technology, Iran	For outstanding and sustained services to the IEEE Computer Society's Technical Committee on Scalable Computing (TCSC) as regional coordinator for the Middle-East region.
Dr. Ira Pramanick, Sun Microsystems, USA	For outstanding and sustained services to the IEEE Computer Society's Technical Committee on Scalable Computing (TCSC) activities in various roles including serving as a coordinator for TCSC High Availability Systems area and chairing TCSC sponsored 8th IEEE International Conference on Cluster Computing.
Dr. Laurence Tianruo Yang, St. Francis Xavier University, Canada	For outstanding services to the IEEE Computer Society's Technical Committee on Scalable Computing (TCSC) as its Conferences Coordinator.
Dr. Heinz Stockinger, Swiss Institute of Bioinformatics, Switzerland	For your outstanding services to the IEEE Computer Society's Technical Committee on Scalable Computing (TCSC) as Program Chair of the First IEEE International Conference on e-Science and Grid Computing (e-Science 2005) and active member of the conference series.
Ms. Jia Yu, The University	For your outstanding services as Cyberchair for the First



Recipient	Citation
of Melbourne, Australia	International Conference on e-Science and Grid Computing sponsored by the IEEE Computer Society Technical Committee on Scalable Computing.
Dr. Omer Rana, Cardiff University, UK	For your outstanding services to the IEEE Computer Society's Technical Committee on Scalable Computing (TCSC) as Program Chair of the 5th IEEE International Symposium on Cluster Computing (CCGrid) and the Grid and active member of the CCGrid conference series.
Dr. Alex Vrenios, DSRLab, USA	For your outstanding and sustained services to the IEEE Computer Society's Technical Committee on Scalable Computing (TCSC) as Coordinator of Performance Evaluation/Benchmarking area.
Dr. Thomas Fahringer, University of Innsbruck, Austria	For your outstanding services to the IEEE Computer Society's Technical Committee on Scalable Computing (TCSC) as Program Chair of the 8th IEEE/ACM International Conference on Grid Computing (Grid 2007).
Dr. Manish Parashar, Rutgers: The State University of New Jersey, USA	For your outstanding and sustained services to the IEEE Computer Society's Technical Committee on Scalable Computing (TCSC) in various roles including serving as PC Chair of Grid 2002 and active member of the Steering Committee of this conference series.
Ms. Serena Coetzee, University of Pretoria, South Africa	For your outstanding services to the IEEE Computer Society's Technical Committee on Scalable Computing (TCSC) activities as coordinator of the TCSC African region.
Dr. Jinjun Chen, Swinburne University of Technology, Australia	For your outstanding services to the IEEE Computer Society's Technical Committee on Scalable Computing (TCSC) activities as a coordinator of the "Workflow Management in Scalable Computing Environments" forum.
Dr. Peter Luksch, University of Rostock, Germany	For your outstanding and sustained services to the IEEE Computer Society's Technical Committee on Scalable Computing (TCSC) activities as a coordinator of the "Software Engineering for Scalable Systems" forum.
Dr. Andreas Boklund, University West, Sweden	For your outstanding and sustained services to the IEEE Computer Society's Technical Committee on Scalable Computing (TCSC) activities as a Secretary of the Book Donation program.
Dr. Rosa Badia, Universitat Politècnica de Catalunya, Spain	For your outstanding services to the IEEE Computer Society's Technical Committee on Scalable Computing (TCSC) as General Chair of the 7th IEEE/ACM International Conference on Grid Computing (Grid 2006)
Dr. Walfredo Cirne, Universidade Federal de Campina Grande, Brazil	For your outstanding services to the IEEE Computer Society's Technical Committee on Scalable Computing (TCSC) as Program Chair of the 7th IEEE International Conference on Cluster Computing and the Grid (CCGrid 2007)
Dr. Warren Smith, University of Texas, Austin, USA	For your outstanding services to the IEEE Computer Society's Technical Committee on Scalable Computing (TCSC) as General Chair of the 8th IEEE/ACM International Conference on Grid Computing (Grid 2007).
Dr. Valerie Taylor,	For your outstanding services to the IEEE Computer Society's



Recipient	Citation
Texas A&M University, USA	Technical Committee on Scalable Computing (TCSC) as General Chair of the 8th IEEE/ACM International Conference on Grid Computing (Grid 2007).
Dr. Vinod Rebello, Universidade Federal, Brazil	For your outstanding services to the IEEE Computer Society's Technical Committee on Scalable Computing (TCSC) activities as coordinator of the TCSC South American region.
Mr. Bindhumadhava BS, Center for Development of Advanced Computing, India	For outstanding services towards the organization of the 3rd International Conference on e-Science and Grid Computing (e-Science 2007) sponsored by the IEEE Computer Society Technical Committee on Scalable Computing.
Dr. Geoffrey Fox, Indiana University, USA	For outstanding services towards the organization of the 3rd International Conference on e-Science and Grid Computing (e-Science 2007) sponsored by the IEEE Computer Society Technical Committee on Scalable Computing.
Dr. Kenneth Chiu, State University of New York (SUNY), Binghamton	For outstanding services towards the organization of the 3rd International Conference on e-Science and Grid Computing (e-Science 2007) sponsored by the IEEE Computer Society Technical Committee on Scalable Computing.

10. Two New Recent Programs

Over the last three months, TCSC has worked towards the establishment of new programs that ignite the minds of young researchers and recognises a prominent member of our community for his/her outstanding *technical* and *community* contribution. To achieve this, TCSC has recently announced the following two programs:

10.1 IEEE International Scalable Computing Challenge

The objective of the IEEE International Scalable Computing Challenge (SCALE) is to highlight and showcase real-world problem solving using scalable computing. The contest will focus on end-to-end problem solving using concepts, technologies and architectures (including Clusters and Grids) relevant to the overall scope of TCSC. Participants in the challenge will be expected to identify significant current real-world problems where scalable computing techniques can be effectively used, and design, implement, evaluate and demonstrate solutions.

The first SCALE 2008 challenge will be held in conjunction with the 8th CCGrid Conference in Lyon, France, May 19-22, 2008 (<http://ccgrid2008.ens-lyon.fr/>). Up to 5 teams will be selected based on proposals submitted and will be invited to participate in the challenge and to demonstrate their project at the CCGrid conference. Participation from students and young researchers, especially in leadership roles, is strongly encouraged. Selected team will receive a travel award up to \$1000 to help with travel to the conference. Each selected team will be expected to present and demonstrate their project at the conference. The teams will be judged by a panel of judges based on the following criteria:



1. The significance and potential impact of the application and its appropriateness for scalable computing
2. Novelty, technical complexity and correctness of the presented solution and the results achieved
3. Extent to which the presented solution pushes the envelope in scalable computing
4. Demonstration and presentation by the team

The top 2 winning teams will be recognised as follows:

First prize: Plaque + \$1000
Second prize: Plaque + \$500

10.2 IEEE Medal for Excellence in Scalable Computing

A medal and a honorarium of \$1000 will be awarded to a volunteer for significant contributions to the scalable computing community through TCSC and/or its activities, coupled with an outstanding record of high quality and high impact research. TCSC believes that this award compliments the exiting awards offered by the IEEE Computer Society which recognises either technical contribution or outstanding community service. This annual award established by the TCSC is unique as it recognises a volunteer who has excelled in both: technical (R&D) and community services.

11. Conclusions and Future Directions

This report has highlighted major activities of the TCSC in 2007, which was significant for the TCSC and its volunteers. It has been a fruitful year for the TCSC in terms of launching of many successful new initiatives in promoting the field of scalable computing. I strongly believe that the TCSC was able to achieve this within a short period of its formation due to full support of its volunteers and their employers. I would take this opportunity to acknowledge the support of all the TCSC members, executive committee, volunteers, those actively participating in open dialogue on the TCSC public mailing list and those involved in the organization of TCSC sponsored conferences. The success of the TCSC discussion forum is evident from active community discussion on major topics by involving both academic and industrial researchers and developers.

As all of our events held in 2007 are highly successful technically, socially, and financially, TCSC in 2008 will have (1) access to a strong community, (2) many more enthusiastic and active volunteers, and (3) availability of a large budget (from the profit made by TCSC sponsored conferences). These resources help sustain the current TCSC programs and support recently announced programs such as: (i) *IEEE International Scalable Computing Challenge* and (ii) *IEEE Medal for Excellence in Scalable Computing*. These programs will contribute towards igniting minds of young researchers and recognizing outstanding volunteers for their contribution and innovation. It is also expected that TCSC will work with the organisers of its events such



as SCxy and contribute towards the initiation of new awards such as Ken Kennedy Award for excellence in the creation software technologies for supercomputing.

I believe strongly that TCSC activities will go from strength to strength and offer excellent services to its members and the community. TCSC and its members should definitely look forward to a highly successful future.

Acknowledgements

I have enjoyed working for the TCSC, IEEE Computer Society, and serving the community during the last two years as the first elected Chair of the TCSC. I would like to take this opportunity to thank all volunteers of TCSC for their dedicated effort and support in ensuring that TCSC is highly successful in delivering excellent service to its members and the community. I would like offer special acknowledgement to IEEE, IEEE Computer Society, Technical Activities Board, and Volunteer Services Coordinators for granting TCSC necessary resources required for successful delivery of services that I had promised in election manifesto to our members and the community.

Thank you all for providing me the opportunity to lead TCSC. It has been my honor and pleasure to serve the TCSC, Society, and our community in my role as TCSC Chair. I will continue to look for new opportunities to further serve you all.

Yours sincerely,

A handwritten signature in black ink, appearing to read "Rajkumar Buyya".

Dr. Rajkumar Buyya

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Appendix: CCGrid 2007 Conference Report

By Dr. Bruno Schulze, LNCC (Brazil), and Dr. Omer Rana, Cardiff University (UK)

For the first time, the Cluster Computing and Grid (CCGrid 2007) conference was held in Latin America, specifically in Rio de Janeiro, Brazil. The event, which took place May 14-17, included strong participation from the Latin American Grid community. Overall, 330 people attended the event, a number greater than any other CCGrid event in its seven-year history. This is a testimony to the fact that the grid and cluster computing communities continue to grow, and early projects that were started in 2001 (when the conference series began) are now maturing and producing significant results. The CCGrid07 main conference track received 218 submissions from 38 different countries, of which 72 were selected for presentation.

Traditionally, the CCGrid series has been held in countries with recognized research centers, such as Australia, Germany, Japan, the United States, the United Kingdom and Singapore, so the hosting of CCGrid in Brazil is a definite recognition of Brazil as one of the world leaders in R&D in the field of cluster and grid computing. In many ways, this is because of the extensive work taking place at Brazilian universities and research laboratories. The CCGrid 2007 conference was organized by the National Laboratory for Scientific Computing (LNCC, Brazil), the University of Melbourne (Australia) and the Federal University of Rio Grande do Sul (UFRGS, Brazil).

Grid computing started as a generalization of cluster computing, promising to deliver unprecedented levels of parallelism to high-performance applications by crossing administrative boundaries. Subsequently, this vision evolved to support on-demand access and composition of any computational service, provided by multiple independent sources. Under this new vision, clusters gained renewed importance as the "super-servers" of the emerging grid infrastructure. Meanwhile, the use of computational and data resources in high-performance applications, undertaken over grid infrastructure, is now starting to become a reality. Today, we face the huge challenge of making on-demand access to any computational service, the "computing as a service" vision, a widespread reality. The CCGrid symposia have been part of this journey, bringing together researchers and practitioners and enabling them to share their insight, results, and experiences in the multi-faceted areas of grid and cluster computing.

CCGrid 2007 areas of interest included grid economies and service architectures, grid architectures and systems, utility computing models for clusters and grids, middleware for clusters and grids, programming models, tools and environments, resource management, performance evaluation and modeling, peer-to-peer systems, grid-based problem solving environments, grid trust and security, service composition and orchestration, community networks, community and collaborative computing networks, scheduling and load balancing, scientific, engineering and commercial applications, and parallel and wide-area file systems, among others.



CCGrid 2007 keynote presentations included “Grids Sandwiched by Web 2.0 and Multicore” by Geoffrey Fox, Indiana University, “Towards an International ‘Computer Science Grid’” by Dr. Franck Cappello, INRIA (France), and “Scale-up and Scale-out: Evolution and Trends in Parallel Processing” by José E. Moreira, IBM Thomas J. Watson Research Center. Fox outlined the need for the grid community to address the challenges of multi-core processor architectures, and outlined that with such computational power available, one could think of a “grid on a chip.” He went on to discuss the types of programming models that would be needed to support such a vision. Fox also outlined the emerging interest in Web 2.0 technologies (mainly centered on social networking themes), and illustrated the large number of users that are now involved in projects making use of such technologies. He emphasized the need for grid computing researchers to better understand the demands of this community, and also suggested that current and excessive focus on Web services standards may be a potential bottleneck for future grid computing growth.

Cappello outlined the work being undertaken in the French Grid5000 project, which involves aggregating computation capacity across France to provide a unique “computer science grid.” As a director of this project, his vision was unique from that of the National Grid Service in the United Kingdom and the TeraGrid in the United States. His focus in Grid5000 was to allow computer scientists to evaluate new algorithms on distributed resources and have exclusive access to such resources by pre-booking/reserving them. The OAR tool was developed within the Grid5000 project to achieve this. Using this approach, a researcher could re-boot machines on the Grid5000 (when they had reserved time on these) and install custom software on these machines for their own work. The Grid5000 also supports a Unix-style file sharing mechanism, whereby users see a distributed file space and can use this to transfer data transparently between machines. Cappello also outlined the novel work in the Dutch DAS-3 project, which involves computational clusters in different parts of the Netherlands connected over an optical backbone network (via programmable optical switches). This is one of the first grid infrastructures that allows programmers to directly program the underlying network switches for their own applications. Recent efforts to connect Grid5000, DAS-3 and the Japanese NAREGI grid also were briefly described. Grid5000 continues to be a novel and highly ambitious project, and one that needs to be considered more closely by grid communities in other parts of the world.

In parallel with the main conference track, there were several workshops on emerging topics, as well as the first IEEE TCSC Doctoral Symposium. There were three workshops on ongoing editions including Agent-Based Grid Computing (AGC07), Biomedical Computations on the Grid (Biogrid07), and Global and Peer-2-Peer Computing (GP2P07). New workshops also were introduced on exciting topics and regional context such as Context-Awareness and Mobility in Grid Computing (WCAMG07) and Programming Models for Grid Computing (PMGC07). In the Latin American context there was a first edition of the Latin American Grid Workshop (LAGrid07) with invited speeches on “The Current Situation and Perspectives for e-



Science in Latin America” by Michael Stanton from RNP (Brazil), and “Towards Truly Ubiquitous Cyberinfrastructure” by Jim Myers from NCSA, and also selected papers.

Additionally, we had an industry track with presentations on “Google Infrastructure for Massively Parallel Processing” by Walfredo Cirne from Google, “Promoting Cooperation in BitTorrent Communities” by Miranda Mowbray from HP Labs Bristol, and “Opportunity and Challenges in e-Science” by Fabrizio Gagliardi and Carlos Hulot from Microsoft Corp. The MapReduce function now being supported by Google provides an interesting way in which industry is adopting functional programming approaches to undertake specific parallel functions. Cirne outlined how the MapReduce function was being parallelized across machines at Google, and how this could be used as a basis to introduce additional grid computing concepts within the company. Mowbray discussed the emerging interest from HP Labs in social networking and outlined how these approaches were being used to investigate legal concerns in file sharing within a community of users. A variety of “sharing patterns” within BitTorrent were used to illustrate some of the ideas. Gagliardi, who formerly led the European Datagrid project, discussed the recently established “technical computing” initiative at Microsoft, as well as the emerging interest from Microsoft to provide additional capability within Microsoft software to support clustering applications.

CCGrid 2007 also offered five tutorials on the topics of autonomic grid computing, MOSIX cluster and grid management system, open source middleware for the grids, ObjectWeb ProActive, designing clusters and grid computing systems with InfiniBand and iWARP, and Gridbus Toolkit for building and managing utility grids for powering e-science and e-business applications.

The “Best Sustained Technical Contribution Award” was given to Professor Ken Kennedy and his team at Rice University. He passed away recently and he had at least one paper in each CCGrid conference since its inception in 2001. Some authors also will be asked to contribute extended versions of papers to a special issue of the Concurrency and Computation: Practice and Experience journal. At the closing session, we had impressions and remarks about the conference given by Geoffrey Fox, Andrew Grimshaw (University of Virginia) and Joerg Schneider (Technische Universität Berlin).

This summary of CCGrid07 cannot fully cover the variety of work presented at the conference. An attempt is made to present some key themes at the conference, and to highlight some new and emerging areas of interest to the community. Interested readers should seek out the proceedings of CCGrid 2007 for additional information. The next CCGrid conference is scheduled to take place in May 19-21, 2008 in Lyon, France. Check out: <http://ccgrid2008.ens-lyon.fr/>