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Bridging Communities

The SC2004 conference will bring representatives from many technical communities together to exchange ideas, celebrate past successes and plan for the future. To reflect this important function, the conference theme is Bridging Communities, which represents not only the technical communities participating in the conference but the architecture of the city, too.

Thank you to the many people who made SC2004 possible.



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Welcome to SC2004

SC2004, the world's leading conference on high performance computing, networking and storage will be held in the brand new David L. Lawrence Convention Center (<http://www.pittsburghcc.com/html/introduction.html>) in Pittsburgh on November 6-12, 2004. The new convention center opened in March, 2003 and features 236,900 square feet of column-free exhibit space for SC2004, extraordinary meeting facilities and a stunning view of the Pittsburgh skyline and riverfront. The facility was designed with high-tech in mind and will be the best convention center yet in the SC Conference series. Pittsburgh itself has undergone a renovation since SC'96 was held in the area. There is a new football stadium, new baseball stadium and several new hotels in the downtown area. SC2004 will be located near the theater district, the cultural center of the city. It is a city the move!

The SC2004 Conference will bring representatives from many technical communities together to exchange ideas, celebrate past successes and plan for the future. To reflect this important function, the conference theme is Bridging Communities, which represents not only the technical communities participating in the conference but the architecture of the city, too. We will utilize state-of-the-art technology in the conference high-performance network, SCinet, and in the A Grid to bring participants from around the world to Pittsburgh. And at the convention center its the technical program, Education Program, and Minority Serving Institutions Program will all connect bridges to new communities.

And most importantly, the SC2004 committee has included new program highlights to bring new communities to the conference. StorCloud will be a multi-vendor resource available to conference participants and could reach a petabyte of random accessible storage. To demonstrate real applications that use this tremendous resource, the StorCloud Challenge will solicit application developers to participate in a competition for the best storage intensive application. Another new highlight will be the InfoStar initiative. This will provide real-time conference information to the participants in an easily accessible form. Information ranging from speaker information to late room changes to registration information is to be available throughout the conference. These innovations will set the standard for state-of-the-art conference information systems.

The Conference Technical Program will continue the tradition of providing high-quality, peer reviewed papers in research and application areas of high performance computing, networking and storage. Papers are being solicited from all communities including industry, DoD, federal

agencies, and universities. The Technical Program will be the highlight of the conference.

And of course, we can't leave out one of the most exciting and innovative aspects of the conference – the Exhibits! As in past years, there will be industry exhibits showcasing the late technology available now that will be on the desktop in just a few more years, and research exhibits showcasing what's new in the university, federal government and not-for-profit sectors. The Exhibits provide the time and the place for real information exchange and can lead to new partnerships and ideas!

On behalf of the SC2004 Conference Committee, I would like to invite you to come to Pittsburgh for the SC2004 Conference. It will be the event of 2004 that you don't want to miss!

Dr. Jeffrey C. Huskamp
SC2004 General Chair

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About SC2004

SC2004 is the premier international conference on high performance computing, networking storage. Founded in 1988, this conference series has grown to now include scientists, researchers, software developers, policy makers, corporate managers, CIOs and IT administrators from universities, industry and government. Attendees become immersed in the latest state-of-the-field developments in technology, applications, vendor products, research results, national policy and national/international initiatives. SC2004 is the one place attendees can see tomorrow's technology being used to solve world-class challenge problems today.

The SC2004 theme, Bridging Communities, ties the program components together and demonstrates how high performance computing, networking and storage touch all scientific disciplines, promote interdisciplinary projects, affect the educational process through the use of computers in modeling and simulation in the classroom, and solve heretofore unsolvable problems in biotechnology, weather research, astronomy, drug research, wearable sensors and many other applications. These technologies provide new ways to solve existing problems in seismic processing, crash simulation, and many other application areas. SC2004 provides attendees opportunity to speak with industry and academic research leaders through the technical program, industry exhibits, research exhibits and Birds-of-a-Feather sessions. Conference participants interact with communities not resident at the Pittsburgh conference site through leading-edge collaboration environments made available by SC Global. New this year will be the StorCloud initiative that incorporates the storage community as an integral element of the conference. As before, the Education Program will bring K-16 teachers and faculty to the conference and provide them the tools and expertise to incorporate modeling and simulation into their classroom.

SC2004 will be the high performance computing and networking event of the year. We look forward to your participation!

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SC2004 HIGH PERFORMANCE COMPUTING, NETWORKING AND STORAGE CONFERENCE



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Contact Information

For a quick response to questions you may have regarding any aspect of the SC2004 conference please send email to the appropriate address below. These are provided in alphabetical order for your convenience.

Awards & Prizes

awards04@sc-conference.org

Birds-of-a-Feather

bofs04@sc-conference.org

Education Program

education04@sc-conference.org

Exhibitor Forum

exhibitor-forum04@sc-conference.org

HPC Bandwidth Challenge

bandwidth04@sc-conference.org

HPC Software Challenge

hpc-challenge04@sc-conference.org

Industry Exhibits

industry-exhibits04@sc-conference.org

InfoStar

infostar04@sc-conference.org

Masterworks

masterworks04@sc-conference.org

MSI Outreach

msi-outreach04@sc-conference.org

Panels

panels04@sc-conference.org

Posters

posters04@sc-conference.org

Research Exhibits

research-exhibits04@sc-conference.org

SC Global

scglobal04@sc-conference.org

SCinet

scinet04@sc-conference.org

StorCloud

storcloud04@sc-conference.org

StorCloud Challenge

storcloud-challenge04@sc-conference.org

Student Volunteers

students04@sc-conference.org

Technical Papers

papers04@sc-conference.org

Tutorials

tutorials04@sc-conference.org

Workshops

workshops04@sc-conference.org

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Registration

Registration

Registration for the SC2004 conference is now open. The conference will be held November 6-12 at the David L. Lawrence Convention Center in Pittsburgh, Pennsylvania. For the most up-to-date information for the technical program go to www.sc-conference.org/sc2004/schedule. Please email any questions regarding registration to scregistration@jspargo.com.

SC2004 Technical Program registration: <https://reg.jspargo.com/sc2004/reg>

Exhibitor registration: <https://reg.jspargo.com/sc2004/exhibitor>

Exhibits Only registration: <https://reg.jspargo.com/sc2004/reg>

Those who register in advance qualify for lower fees and may pick up their conference materials at the David L. Lawrence Convention Center beginning Saturday, November 6 (see registration schedule below).

Registration Fees

Advance Registration fees will be as follows:

- Technical Program, Member \$390
- Technical Program, Non-Member \$495
- Technical Program, Student/Retired Member \$100
- Tutorials, One-Day Passport, Member \$375
- Tutorials, One-Day Passport, Non-Member \$485
- Tutorials, One-Day Passport, Student/Retired Member \$100
- Tutorials, Two-Day Passport, Member \$595
- Tutorials, Two-Day Passport, Non-Member \$755
- Tutorials, Two-Day Passport, Student/Retired Member \$160
- Grid Computing Workshop (only) \$175
- Grid Computing Workshop w/Tech Program registration \$75

Late Registration fees will be as follows:

- Technical Program, Member \$560
- Technical Program, Non-Member \$700
- Technical Program, Student/Retired Member \$150
- Tutorials, One-Day Passport, Member \$525

Tutorials, One-Day Passport, Non-Member \$660
Tutorials, One-Day Passport, Student/Retired Member \$150
Tutorials, Two-Day Passport, Member \$825
Tutorials, Two-Day Passport, Non-Member \$1,035
Tutorials, Two-Day Passport, Student/Retired Member \$240
Grid Computing Workshop (only) \$250
Grid Computing Workshop w/Tech Program registration \$125

To qualify for advance registration discounts your registration form **and payment** must be received by **midnight EDT, Friday, October 8, 2004**. Registrations received after October 8, 2004 will be charged at the late/on-site registration rate.

Discounted Rate for Retired and Student Members

To qualify for discounted registration rates, include your current ACM, ACM SIGARCH, IEEE or IEEE Computer Society membership number(s) or a copy of a valid full-time student identification card with the registration form.

Registration Confirmation

For Internet registrations, immediate email confirmation will be sent. Registrations processed in the office will receive email or faxed confirmation of conference registration within three to five business days of receiving your registration. If you do not receive confirmation, please call +1-449-6418.

Payment

Payment must accompany all registration forms and can be made by credit card (MasterCard, VISA, American Express), company or personal check, and wire transfers (a fee of \$25 per wire transfer should be added to the total amount). Checks or money orders must be in U.S. funds drawn on U.S. banks, and payable to the ACM/IEEE SC2004. You can register online or, mail or fax your registration form. No registrations will be accepted over the phone. **Forms received without payment will not be processed.**

On-site Registration

On-site registrants will pay late registration fees. Forms of payment accepted on site: credit card (MasterCard, VISA, American Express), traveler's checks, company and personal checks, and cash. Wire transfers will not be accepted at on-site registration.

International Attendees

International attendees can register in advance and pay by wire transfer if needed for an additional processing fee of \$25 per wire transfer. Wire transfers must be received by October 22, 2004. **will not be accepted at on-site registration.**

Tutorials

Full-day tutorials are being offered on Sunday and Monday, November 7-8. Tutorials are not included in the fee for technical program registration and require separate registration. A special Tutorials Passport for one or two days is available. A one-day passport (either Sunday or Monday) entitles you to attend any tutorials offered on that day, a tutorial luncheon, and your selection of notes for one full-day tutorial. A two-day passport gives you approximately a 20% discount on the price of two one-day passports. *Your selection of tutorial notes must be specified on the registration form.*

Seating at the tutorials is on a first-come, first-served basis. You are welcome to sit in on as r

other tutorials as you like for the day(s) you are registered, but you will receive only the notes you reserve in advance.

Tutorial Notes

Tutorial notes can be picked up at the SC2004 Conference Store upon presentation of the no ticket(s) provided in your registration packet. You will only receive notes for the tutorial(s) you selected on your registration form. A complete set of tutorial notes can be purchased on CD-ROM at the Conference Store for \$50.00.

Proceedings

Attendees registered for the technical program will receive one copy of the SC2004 proceedings on CD-ROM. Any extra copies of the proceedings will be on sale at the Conference Store.

Exhibits Only Badges

The exhibit hall is open from 10 am to 6 pm Tuesday and Wednesday and 10 am to 4 pm on Thursday. Exhibits Only Badges (\$80) allow entrance to the exhibit floor for one of the three days of the exhibition: Tuesday, Wednesday, or Thursday. Exhibits only badges can only be picked up for the day (Tuesday, Wednesday, Thursday) of the exhibition. Exhibits Only registration is available to children 12-16, however, they must be accompanied by an adult at all times. Children under age 12 are not permitted on the exhibit floor at any time.

Cancellations and Substitutions

All changes and cancellations must be submitted in writing. Cancellation requests must be received by October 22, 2004 to qualify for a refund less a \$50.00 processing fee. No refunds will be issued after December 31, 2004. Refunds will be processed based on the original form of payment within 48 days after the close of the meeting. No-shows will be charged the full registration fee.

SC2004 Registration Center

11212 Waples Mill Road, Suite 104

Fairfax, VA 22030

1-703-449-6418

1-703-631-6288 – fax

scregistration@jspargo.com

Substitutions are allowed. A letter on your company's letterhead is required from the original registrant stating the conditions of the substitution and the name of the replacement.

Special Registration Needs

If under the Americans with Disabilities Act you require specific aids or services during your registration please notify us prior to the registration deadline. We will attempt to accommodate participant special registration needs. Please contact:

Tony Baylis

SC2004 Registration Chair

+1 217 244 5354

+1 217 244 1987 (fax)

tbaylis@ncsa.uiuc.edu

Registration and Store Hours

Saturday 11/6 1 pm – 6 pm

Sunday 11/7 7:30am – 8 pm

Monday 11/8 7:30am – 8 pm

Tuesday 11/9 7:30am – 5 pm

Wednesday 11/10 7:30am – 5 pm

Thursday 11/11 7:30am – 5 pm

Friday 11/12 8 am – 11 am

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Masterworks **Invited Speakers** **GRID 2004** **Awards & Prizes** **Workshop**
SC Global **HPC Software Challenge** **MSI Outreach** **HPC Bandwidth Challenge**

Overview

The SC2004 Technical Program serves as the bridge between attendees and the research and development community, where new and innovative ideas in computing, networking, software, and storage are presented, exchanged, discussed, and debated. This year's program mixes some of the tried and true events of previous SC conferences, such as technical papers and tutorials, with new events such as the HPC Software Challenge. The SC2004 Program Committee has worked hard to build an outstanding technical program, which is composed of:

- **Invited Speakers.** Visionaries and leaders in the field will present their views and prognostications on the field of supercomputing.
- **Technical Papers.** From almost 200 submissions, 60 outstanding papers by some of the leading researchers in the field of high performance computing will examine a diverse range of technical issues.
- **Tutorials.** A total of 23 short courses, from introductory to advanced level, are offered. Also, for the first time, tutorial attendees will be provided with a CDROM containing all tutorial presentations.
- **Panels and BOFs.** Numerous panels and Birds-of-a-Feather sessions will provide forums for discussion, analysis, and a little pontification. As an added feature, the panel "HPC Survivor" offers a contest of wit and mental agility - only available at SC2004.
- **Workshops.** Eight workshops offer the opportunity for in-depth presentation, discussion, and interaction on topics ranging from the highly technical to the geo-political. Technical program registration is required for workshops being held in the convention center on November 7 and November 8. All SC2004 attendees are welcome to attend and participate in the workshops held on November 12. The GRID 2004 Workshop requires separate registration and payment and will be held in the Westin Convention Center Hotel.
- **Masterworks.** Eight sessions consisting of 16 invited talks will highlight the application of supercomputing and associated technologies to real world problems.
- **HPC Software Challenge.** Software engineering has been almost totally neglected in the field of supercomputing. This first-of-a-kind event showcases best practices, issues, and lessons in software engineering and high performance computing.
- **Awards.** Awards ceremony recognizes leadership in supercomputing. Featured are the *Seymour Cray Computer Science and Engineering Award* and *Sidney Fernbach Memorial Award*, which include presentations by the winners. Also, the following awards are presented in this ceremony: Gordon Bell, HPC Software Challenge, StorCloud,

Bandwidth Challenge, Best Paper, Best Student Paper, and Best Poster awards.

For the most up-to-date information on the technical program, we encourage you to look at the interactive calendar at www.sc-conference.org/sc2004/schedule.

Click [here](#) for SC2004 Proceedings CD Copyright Information.

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Technical Papers

The SC2004 Technical Papers program is the industry's premier forum for disseminating innovative and important advances in high-performance computing, networking, and storage from academia, government, and corporate institutions world wide. Fifty-nine papers have been selected for presentation from 192 submissions contributed by 665 authors. The Technical Papers program spans theory, practice, modeling, experimentation, infrastructure, and application of high performance computing, advanced networking, innovative storage solutions, systems engineering and grid technologies. The papers are presented in twenty sessions over three days.

Awards are given for best technical paper and best student paper. In all, six papers are candidates for best technical paper and twelve for best student paper (69 submitted, 23 accepted). The nominated papers are marked within the program. The Technical Papers program also highlights four Gordon Bell Prize finalist papers (from 16 submissions). These papers will be presented "Extreme Performance" and "Emerging Architectures" sessions on Wednesday afternoon. The finalist papers are marked within the program.

The Technical Papers program is the culmination of hundreds of thousands of hours of individual and group efforts. Special thanks to the Technical Papers Committee, listed below. The quality of the program is a testament to their commitment to the paper review process. The Area Chairs deserve special note, as the process would not have worked without them. In addition to the committee members, external referees contributed their time and expertise. Thanks, too, to the SC2004 Technical Program Committee and other conference committees that support the technical papers program in myriad ways. And of course, our deepest thanks to the authors for contributing to an exceptional program.

We welcome your participation in the SC2004 Technical Papers program.

Jeff Kuehn, SC2004 Technical Papers Co-Chair
 Jack Dongarra, SC2004 Technical Papers Co-Chair

Click [here](#) for SC2004 Proceedings CD Copyright Information.

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Date	Event Type	Start Time	End Time	Rm #	Chair	Main Title/Event

11/09	Paper	10:30AM	12:00PM	315-316	Subhash Saini (NASA Ames Research Center)	Applications I
11/09	Paper	10:30AM	12:00PM	317-318	Merritt E. Jones (The MITRE Corp.)	Distributed Data Management
11/09	Paper	10:30AM	12:00PM	319-320	David Snelling (Fujitsu)	Grid Services
11/09	Paper	01:30PM	03:00PM	317-318	William Carlson (IDA Center for Computing Sciences)	Architectural Paradigms
11/09	Paper	01:30PM	03:00PM	319-320	Mary Hall (USC/ISI)	Compiler Technology
11/09	Paper	01:30PM	03:00PM	315-316	Yves Robert (ENS Lyon)	Scheduling Algorithms
11/09	Paper	03:30PM	05:00PM	315-316	Xian-He Sun (Illinois Institute of Technology)	Applications II
11/09	Paper	03:30PM	05:00PM	319-320	Shinji Shimojo (Osaka University.)	High Throughput Grid Transport Protocols
11/10	Paper	10:30AM	12:00PM	315-316	Daniel S. Katz (JPL/Caltech)	Applications III
11/10	Paper	10:30AM	12:00PM	319-320	Celso L. Mendes (University of Illinois)	Performance Measurement & Optimization
11/10	Paper	10:30AM	12:00PM	317-318	Philip Michael Papadopoulos (San Diego Supercomputer Center/UC San Diego)	Terascale Networking
11/10	Paper	01:30PM	03:00PM	317-318	William Douglas Gropp (Argonne National Laboratory)	Extreme Performance
11/10	Paper	01:30PM	03:00PM	315-316	Alan Sussman (University of Maryland)	Fault Tolerance
11/10	Paper	03:30PM	05:00PM	315-316	Jose L Munoz (NSF)	Emerging Architectures
11/10	Paper	03:30PM	04:30PM	315-316	Henri Casanova (UCSD)	Performance Evaluation Algorithms
11/11	Paper	10:30AM	12:00PM	317-318	Thomas Wingfield Page (NSA)	Advanced Hardware Features
11/11	Paper	10:30AM	12:00PM	315-316	David William Walker (Cardiff University)	Applications IV

11/11	Paper	10:30AM	12:00PM	319-320	John L Cole (IEEE Mass Storage Systems Technical Committee)	File Systems
11/11	Paper	03:30PM	05:00PM	319-320	Satoshi Matsuoka (Tokyo Institute of Technology)	Grid Resource Management
11/11	Paper	03:30PM	05:00PM	317-318	Steven Gregory Parker (University of Utah)	Processor & Communication Performance

Questions? Please send email to: papers04@sc-conference.org.

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Tutorials

Welcome to the SC2004 Tutorials Program Web Site!

SC conference tutorials are a highlight of the technical program and a key reason for many people to attend the conference. SC tutorials provide attendees with opportunities to learn from, and with, internationally recognized experts on a wide variety of topics related to high performance computing, communication and storage.

This year's tutorials cover an exciting mixture of popular past topics and interesting new ones chosen from an exceptionally competitive field of proposals. As is customary, we offer both full and half-day tutorials ---17 full day and 6 half day--- for a total of 23 tutorials to choose from. A One-Day Tutorial Passport allows attendees flexibility to attend multiple tutorials. In response to your interest, we are again offering a selection of "hands-on" tutorials. Please note that some of these tutorials rely on user-supplied laptops for the hands-on portion of the tutorial.

A major innovation this year is in the treatment of tutorial notes. As in the past, hard-copy notes will not be made available to all tutorial registrants. However, instead of selling additional copies of the notes, we will make all tutorial notes available on a single CD sold at the conference store. Be sure to take advantage of this innovation when you register or visit the store during the conference.

Many thanks are due to the members of the Tutorials Committee (whose names appear at the bottom of this page) and to the Program Committee, who worked so hard to bring this year's tutorial program together. Thanks, too, to all the presenters who have created such an exciting program. Join us!

SC2004 Tutorials Committee

Vice Chair, Fred Johnson, DOE Office of Science, Chair

Deputy Chair, Eric Greenwade, Idaho National Engineering and Environmental Laboratory

Blaise Barney, Lawrence Livermore National Laboratory

Randy Bramley, Indiana University

Candy Culhane, National Security Agency

Scott Denham, IBM

Brent Gorda, Lawrence Berkeley National Laboratory

Debbie Gracio, Pacific Northwest National Laboratory

Kei Hiraki, University of Tokyo

Ricky Kendall, DOE Ames Laboratory

Tim Leite, Visual Numerics, Inc.
 Bob Lucas, Information Sciences Institute
 John Mellor-Crummey, Rice University
 Bertrand Meltz, CEA, France
 Rod Oldehoeft, Los Alamos National Laboratory
 Beth Plale, Indiana University
 Rob Ross, Argonne National Laboratory
 Stephen L. Scott, Oak Ridge National Laboratory
 Lauren Smith, National Security Agency
 John Sopka, Sun Microsystems
 Niraj Srivastava, Hewlett-Packard Company
 Scott Studham, Pacific Northwest National Laboratory
 Sheila Vaida, Lawrence Livermore National Laboratory
 Harvey Wasserman, Los Alamos National Laboratory
 Keven Wohlever, Ohio Supercomputer Center
 Patrick Worley, Oak Ridge National Laboratory

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Date	Event Type	Start Time	End Time	Rm #	Chair	Main Title/Event
11/07	Tutorial	08:30AM	05:00PM		Rob Ross (MCS/ANL)	S01: Advanced I/O and One-Side Communication
11/07	Tutorial	08:30AM	05:00PM		Quentin Fielden Stout (University of Michigan)	S02: Parallel Computing 101
11/07	Tutorial	08:30AM	05:00PM		Gary Kumfert (Lawrence Livermore National Laboratory)	S03: Bridging Programming Languages with
11/07	Tutorial	08:30AM	05:00PM		Tarek El-Ghazawi (George Washington University)	S04: Reconfigurable Supercomputing
11/07	Tutorial	08:30AM	05:00PM		John Mellor-Crummey (Rice University)	S05: Practical Application Performance Analysis on Linux System
11/07	Tutorial	08:30AM	05:00PM		Craig Stewart (Indiana University)	S06: Open Source Tools for Computational Biology
11/07	Tutorial	08:30AM	05:00PM		Nancy Wilkins-Diehr	S07: TeraGrid: Once, Run Anywhere
11/07	Tutorial	08:30AM	05:00PM		Dhableswar K. Panda (The Ohio State University)	S08: State of InfiniBand in Designing HPC Clusters, Storage Systems, and Datacenters
11/07	Tutorial	08:30AM	05:00PM		Greg Watson (Los Alamos National Laboratory)	S09: Cluster Management Innovative Approaches to Cluster Computing

11/07	Tutorial	08:30AM	05:00PM	Åsmund Ødegård (Simula Research Laboratory)	S10: High Performance Computing in P
11/08	Tutorial	08:30AM	05:00PM	Jeffrey Michael Squyres (Indiana University)	M01: Taking Yo Application to th Level: Threading Dynamic Proce and Multi-Netwo Utilization
11/08	Tutorial	08:30AM	05:00PM	Alice Koniges (LLNL)	M02: Application Supercomputing Scalable Architectures
11/08	Tutorial	08:30AM	05:00PM	David Edward Bernholdt (Oak Ridge National Laboratory)	M03: Componer Software for High-Performan Computing
11/08	Tutorial	08:30AM	05:00PM	Subhash Saini (NASA Ames Research Center)	M04: Hot Chips Hot Interconnec High End Comp Systems
11/08	Tutorial	08:30AM	05:00PM	Darren J. Kerbyson (Los Alamos National Laboratory)	M05: A Practica Approach to Performance Ar and Modeling of Large-Scale Sy
11/08	Tutorial	08:30AM	05:00PM	Phillip Dykstra (WareOnEarth Communications)	M06: High Performance D: Transfer
11/08	Tutorial	08:30AM	05:00PM	Vern Paxson (ICSI / LBNL)	M07: Cyberseci Open Scientific Facilities
11/08	Tutorial	08:30AM	12:00PM	Tarek El-Ghazawi (George Washington University)	M08: UPC: Unif Parallel C
11/08	Tutorial	08:30AM	12:00PM	Michael Wilde (Argonne)	M09: Virtual Da Management for Computing
11/08	Tutorial	08:30AM	12:00PM	Allan Edward Snaveley (San Diego Supercomputer Center)	M10: Methods fr Performance Engineering of Scientific Applications
11/08	Tutorial	01:30PM	05:00PM	Lorna Alice Smith (EPCC, The University of Edinburgh)	M11: Performar Scaling on Constellation Sy
11/08	Tutorial	01:30PM	05:00PM	Lee Liming (Argonne National Laboratory)	M12: Beyond G Lessons Learne the Grid
11/08	Tutorial	01:30PM	05:00PM	Joseph Pelissier (McDATA Corporation)	M13: Constructi Advanced Stora Networks: Integi Virtual Fabrics, Routing, and IP Storage

Questions ? Please send email to: tutorials04@sc-conference.org

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Birds-of-a-Feather (BOF) Sessions

Birds-of-a-Feather (BOF) sessions provide forums for conference attendees to discuss topics of mutual interest. BOFs are open to all conference attendees, including exhibitors and exhibits-only badge holders. The conference will provide meeting room facilities and post daily schedule of the BOFs. BOF proposals that exploit the SC Global infrastructure to conduct multinational and cross-cultural discussions are strongly encouraged. (Please note that BOFs held in conjunction with SC Global must be proposed by the extended April 26 SC Global deadline, not the later B deadline.)

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Date	Event Type	Start Time	End Time	Rm #	Chair	Main Title/Event
11/09	BOF	12:15PM	01:15PM	321	Charles B Carroll (Cray Inc.)	Cray Program Environments
11/09	BOF	12:15PM	01:15PM	302	Fabrizio Magugliani (SGI)	Enabling terabyte-scale computing
11/09	BOF	12:15PM	01:15PM	306/307	William Miner (NCO/ITRD)	HECRTF - Implementing Plan
11/09	BOF	12:15PM	01:15PM	323	Susanne M. Balle (Hewlett Packard)	How do we debug, and tune applications on Grids
11/09	BOF	12:15PM	01:15PM	325	Daniel Kevin Terpstra (Univ. of Tennessee ICL)	PAPI Users Group
11/09	BOF	12:15PM	01:15PM	331	Terry Jones (Lawrence Livermore National Laboratory)	PERUSE: A Performance Revealing Extensions Interface to MPI
11/09	BOF	12:15PM	01:15PM	324	Guy Adams (Univ. of Utah - CHPC)	The Maui Consortium

11/09	BOF	05:30PM	07:00PM	306/307	Sharon Collins (East Carolina University)	Collaboration Across Boundaries for DoD High Performance Computing Use
11/09	BOF	05:30PM	07:00PM	321	Thomas Patrick Michael Murphy (Contra Costa College)	HPC in the community college environment: little iron, technicians, and computational science
11/09	BOF	05:30PM	07:00PM	315/316	Michael Brown (Silicon Graphics, Inc.)	Linux Visualization: A Holistic Approach to Understanding Terascale Data Sets
11/09	BOF	05:30PM	07:00PM	319/320	Thomas Michael DeBoni (LBNL/NERSC)	NERSC Users Group
11/09	BOF	05:30PM	07:00PM	323	Stephen Lucien Scott (Oak Ridge National Lab)	OSCAR community meeting
11/09	BOF	05:30PM	07:00PM	302	James Patton Jones (Altair Grid Technologies)	Portable Batch System (PBS)
11/09	BOF	05:30PM	07:00PM	317/318	Rob Ross (MCS/ANL)	PVFS2: A Portable File System for Linux Clusters
11/09	BOF	05:30PM	07:00PM	303/304/305	Erich Strohmaier (CRD/LBNL)	TOP500 Supercomputing
11/10	BOF	12:15PM	01:15PM	325	Chris Smith (Platform Computing)	Extending and Applying the Community Scheduler Framework (CFS)
11/10	BOF	12:15PM	01:15PM	322	Mark Smith (Gelato)	Gelato: The Lithium Community Working for You
11/10	BOF	12:15PM	01:15PM	324	Christian Tanasescu (SGI)	HPC in the AUTOMOTIVE World
11/10	BOF	12:15PM	01:15PM	302	David Barkai (Intel)	Project Columba and the promise of new science
11/10	BOF	12:15PM	01:15PM	323	Doug O'Flaherty (AMD)	State of Tools Compilers on AMD64 (X86-64)
11/10	BOF	12:15PM	01:15PM	331	Clive Surfleet (Exanet)	Tiered Storage
11/10	BOF	12:15PM	01:15PM	306/307	Tarek El-Ghazawi (George Washington University)	UPC: Unified Parallel C
11/10	BOF	05:30PM	07:00PM	317/318	Walt F. Brooks (NASA Advanced Supercomputing (NAS) Division)	Customer Experiences Using the SGI Altix/T3E Supercluster

11/10	BOF	05:30PM	07:00PM	315/316	Sharad Garg (Intel Corporation, Advanced Computing Program)	Dynamic Provisioning & Resource Management
11/10	BOF	05:30PM	07:00PM	325	Arthur Maccabe (University of New Mexico)	FAST-OS: Scalability in Runtime and Operating Sys
11/10	BOF	05:30PM	07:00PM	321	Gary Bertoline (Purdue University)	International Visualization Consortium
11/10	BOF	05:30PM	07:00PM	303/304/305	Daniel A. Reed (University of North Carolina at Chapel Hill)	National Prior for Computational Science--A P Town Hall Me
11/10	BOF	05:30PM	07:00PM	319/320	Sanjiv Shah (OpenMP ARB/Intel)	OpenMP: Nov Tomorrow
11/10	BOF	05:30PM	07:00PM	324	Matthew Thomas O'Keefe (Red Hat)	Red Hat Clust
11/10	BOF	05:30PM	07:00PM	323	Karen Green (NCSA)	Staying afloat sea of acronym survival skills f HPC communicator
11/11	BOF	12:15PM	01:15PM	321	Marlon E. Pierce (Indiana University)	Computing Pc Users and Developers
11/11	BOF	12:15PM	01:15PM	322	Peter J. Braam (Cluster File Systems, Inc.)	Deploying the Lustre File Sy
11/11	BOF	12:15PM	01:15PM	306/307	Brooks Davis (Aerospace Corporation)	High Perform BSD
11/11	BOF	12:15PM	01:15PM	302	Raymond L Paden (IBM)	How to Build a Petabyte Stor Subsystem
11/11	BOF	12:15PM	01:15PM	323	Marvin Theimer (Microsoft Corporation)	HPC.Net
11/11	BOF	12:15PM	01:15PM	324	Padmashree Apparao (Intel Labs)	Reliability con in the HPC wc

Questions? Please send email to bofs04@sc-conference.org.

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Panels

In support of the conference theme *Bridging Communities*, this year's technical program includes seven panels that will present and discuss controversial topics from a number of diverse points of view, including views from outside the United States, and with audience participation, on timely topics.

Historically, SC panels have engendered lively discussion and even passionate debate. Panel discussions, much more than any other SC conference element, foster a free clash of ideas in a spirit of collegiality. Topics covered by the panels include the role of high-performance computing in the global economy, the future of high-performance computing, the state of Grid computing in Europe, the state-of-the-art for benchmarking and predicting performance, the role of minorities in Grid and high-performance computing, and a special format panel that allows the audience to weigh in on their opinions of the expert's opinions! See below for the complete panels program.

Events						
Date	Event Type	Start Time	End Time	Rm #	Chair	Main Title/Event
11/09	Panel	03:30PM	05:00PM	317-318	David E. Shaw (D. E. Shaw & Company)	Global Leadership
11/10	SC Global Showcase, Panel	10:30AM	12:00PM	403-405		MSI Consortium Panel
11/12	Panel	08:30AM	10:00AM	319-320	Steven Duplessie (ESG)	Availability in Storage
11/12	Panel	08:30AM	10:00AM	317-318	Richard S. Hirsh (Science Foundation Ireland)	European Grid/HPCC
11/12	Panel	08:30AM	10:00AM	315-316	Cynthia Patterson (CSTB)	Future of Supercomputing
11/12	Panel	10:30AM	12:00PM	315-316	Maxine Brown (UIC)	GLIF Infrastructure

11/12	Panel	10:30AM	12:00PM	319-320	Cherri M. Pancake (NACSE/Oregon State U)	HPC Survivor
11/12	Panel	10:30AM	12:00PM	317-318	Jack Dongarra (UTK/ORNL)	HPCchallenge Benchmarks

Questions? Please send email to: panels04@sc-conference.org.

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Posters

Poster Exhibits

Poster exhibits offer an excellent opportunity to learn about recent research results, tools, and experiences. Posters are located in a prominent location -- the open corridor crossing the exhibit floor -- and are conveniently grouped according to four major topic areas: Grid Services and Applications; Performance; Visualization and Data Analysis; Science and Engineering Applications; and Networking and Security. The Posters Reception on Tuesday evening provides an informal setting for one-on-one interactions with poster authors.

SC2004 Posters Committee:

- Cherri Pancake, Oregon State University (Chair)
- Polly Baker, Indiana University
- David Barkai, Intel
- Virginia Bedford, Arctic Region Supercomputing Center
- Hugh Caffey, Sun Microsystems
- Jeff Graham (Aeronautical Systems Center)
- Steve Hammond, National Renewable Energy Laboratory
- Adolfy Hoisie, Los Alamos National Laboratory
- Marty Itzkowitz, Sun Microsystems
- Jeff Kuehn (National Center for Atmospheric Research)
- Richard Moore, San Diego Supercomputer Center

Events						
Date	Event Type	Start Time	End Time	Rm #	Chair	Main Title/Event
11/09	Poster	05:00PM	07:00PM			Posters 1: Grid Resources
11/09	Poster	05:00PM	07:00PM			Posters 2 - Applications
11/09	Poster	05:00PM	07:00PM			Posters 3 - Networking and Security

11/09	Poster	05:00PM	07:00PM	Posters 4 - Visualization and Data
11/09	Poster	05:00PM	07:00PM	Posters 5 - Performance

Questions? Please send email to: posters04@sc-conference.org.

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Masterworks

Masterworks are invited presentations that highlight novel and innovative ways of applying advanced computing and communications technology to solve challenging, real-world problems. Cars, bridges, grids, flicks, and fat pipes are just some of the topics Masterworks cover this year.

Supercomputing goes to the movies! Come see how all the HPC technologies you've been researching for years have been put to use to keep you and your family entertained in two of the latest Hollywood mega-hits.

The automobile and oil industries were two of the earliest commercial adopters of HPC. Two sessions will focus on each of these industries. In the automotive session, you get up-to-the-minute info on how these huge manufacturers are using the latest technologies, and what they want for future systems. In the second session, you will hear about the latest innovations in HPC use in the oil industry including how oil and gas exploration companies are now putting supercomputers on to help them locate new petroleum sources.

Designing and buying HPC systems have become so complex, that it takes HPC resources just to get to the next generation of HPC designed and purchased. In two sessions we will hear about the latest trend. The first of these two sessions will show how grid technology helps reduce costs and increase productivity in electronic design automation. In the second session we will describe two quantitative models for improved HPC acquisition decision-making, and how sometimes it takes an HPC system to solve the optimization problem to decide what HPC system to buy!

In keeping with the SC'04 theme about data movement and storage, two Masterworks sessions will focus on infrastructure for data intensive workloads. One will showcase a new dedicated high-bandwidth optical pipe implementation and how this technology can fundamentally change distributed systems and applications design. The other will focus on data management for weather and climate forecasting.

Few topics can be more important than applying high technology to improve Homeland Security. A session will show you how leading researchers are approaching this challenging area.

Masterworks presentations are in room 303-305, on the southeast side of the convention center. We hope to see you there for what promises to be a great program.

Jeffrey K. Hollingsworth, SC2004 Masterworks Co-Chair

Events						
Date	Event Type	Start Time	End Time	Rm #	Chair	Main Title/Event
11/09	Masterworks	10:30AM	12:00PM	303-305	Harvey J. Wasserman (Los Alamos National Laboratory)	Homeland Security
11/09	Masterworks	01:30PM	03:00PM	303-305	Ann Chervenak (USC Information Sciences Institute)	Case Studies in Deploying Grid
11/09	Masterworks	03:30PM	05:00PM	303-305	Jeffrey K. Hollingsworth (University of Maryland)	HPC Acquisition
11/10	Masterworks	10:30AM	12:00PM	303-305	Stephen Poole (Los Alamos National Laboratory)	Oil and Gas Exploration
11/10	Masterworks	01:30PM	03:00PM	303-305	Debra S. Goldfarb (IBM)	HPC Goes to the Movies
11/10	Masterworks	03:30PM	05:00PM	303-305	Thomas Nelson (Storage Tek)	Data Intensive Applications
11/11	Masterworks	10:30AM	12:00PM	303-305	Gwendolyn Huntoon (Pittsburgh Supercomputing Center)	Optical Network and Cyberinfrastructure
11/11	Masterworks	03:30PM	05:00PM	303-305	Steven Joachims (Cray Canada)	Automotive Industry

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Invited Speakers

Keynote Address

Kicking off the technical portion of the program on Tuesday, November 9, will be Tom West, President and CEO of National LambdaRail, Inc., a national effort comprised of members and associates from across the country focused on implementing and operating a national network infrastructure to serve the needs of the advanced research community. His talk is titled NLR: Providing the Nationwide Network Infrastructure for Network and "Big Science" Research. He will discuss how NLR came into being, what it is comprised of, and how it is being initially used.

[Read the abstract](#)

[Read more about Tom West](#)

Invited Speakers

This year's invited speakers include the world's leaders in high performance computing systems representing a cross section of the growing HPC community. It is important to explore both the diversity of the HPC community, along with the potential for expanded opportunities as we look to the future. In this context, invited speakers will describe the applications of HPC systems for national security, industrial, genomics, and renaissance communities. Traditional HPC is going through a significant phase change driven in part by major technology innovations and growing accessible HPC capability.

[Charles J. Holland](#), Deputy Under Secretary of Defense for Science and Technology, will speak on "High Performance Computing in Context." His talk will examine high performance computing in a broader context, discussing the "spheres of influence" that are expected to shape the future of the field.

[Stan Ahalt](#), Executive Director of the Ohio Supercomputer Center, will speak on "Towards a High Performance Computing Economy." Ahalt will address the questions: can HPC be realistically viewed as one of the critical economic drivers for our future? Is this view of HPC realistic? Is it realizable?

[Gane Ka-Shu Wong](#), Associate Director of Beijing Institute of Genomics, will discuss "Computational Opportunities in the Era of Abundant Biological Data." Wong will show examples of where high performance computing is used in biology, past, present and future. Then, to put it all in perspective, he will discuss how genomes evolve.

[Dr. Daniel A. Reed](#), Director, Renaissance Computing Institute Duke, UNC and NCSU. Reed's talk, entitled "Computing - An Intellectual Lever for Multidisciplinary Discovery," will describe emerging opportunities in the arts, humanities, science and engineering where interdisciplinary Renaissance approaches can have profound impact on discovery and creative expression.

Events						
Date	Event Type	Start Time	End Time	Rm #	Chair	Main Title/Event
11/10	Invited Speaker	08:30AM	09:15AM	Ballroom B-C	Charles J. Holland	High Performance Computing in C
11/10	Invited Speaker	09:15AM	10:00AM	Ballroom B-C	Stan Ahalt	Toward a High Performance Computing Eco
11/11	Invited Speaker	08:30AM	09:15AM	Ballroom B-C	Gane Ka-Shu Wong	Computing Opportunities in the Era of Abundant Biological Data
11/11	Invited Speaker	09:15AM	10:00AM	Ballroom B-C	Daniel A. Reed (University of North Carolina at Chapel Hill)	Computing - An Intellectual Lever for Multidisciplinary Discovery

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GRID 2004

The Fifth IEEE/ACM International Workshop on Grid Computing (Grid 2004) will meet on Monday, November 8, in conjunction with SC2004. With its exclusive focus on grid computing and related issues, the Grid Computing Workshop has become an important venue for grid researchers and practitioners, drawing a record attendance in 2003. This will be the fourth year the Grid Computing Workshop has been co-located with the SC conference, having formed a valuable complement to the SC'XY experience.

We also note that this year, the workshop is being organized by Mark Baker and Rajukumar Buyya, the original organizers of the workshop back in 2000.

The GRID 2004 Workshop requires separate registration and payment and is held in the Westin Convention Center Hotel. For registration, please go to the SC2004 registration page at www.sc-conference.org/sc2004/registration.html.

For complete information, please visit <http://www.gridbus.org/grid2004> or <http://www.gridcomputing.org>.

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Awards

The conference again will serve as the venue for several distinguished professional awards recognizing key contributions to high performance computing, networking and storage.

Gordon Bell

The Gordon Bell Award recognizes practical uses of high performance computers, including performance of an application and best achievement in cost performance.

Seymour Cray

The Seymour Cray Computer Science and Engineering Award recognizes innovative contributions to high performance computing systems that best exemplify the creative spirit of Seymour Cray.

Sidney Fernbach

The Sidney Fernbach Memorial Award honors innovative uses of high performance computing problem solving.

These prestigious honors and more will be presented during a special ceremony held as a capstone to the conference.

More information on these awards will be available at a later date.

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Workshops

The SC2004 program includes a set of independently planned workshops. These eight workshops offer the opportunity for presentation and interaction on topics ranging from the highly technical to the geo-political. Technical program registration is required for workshops being held in the convention center on November 7 and November 8. All conference attendees are welcome to attend and participate in the workshops held on November 12. The GRID 2004 Workshop requires special registration and payment and will be held in the Westin Convention Center Hotel.

Events						
Date	Event Type	Start Time	End Time	Rm #	Chair	Main Title/Event
11/06	Workshop	08:30AM	05:00PM			China/HPC Workshop
11/07	Workshop	08:30AM	12:00PM	406		High-Performance Cluster Storage
11/07	Workshop	01:30PM	05:00PM	406		Open MPI Workshop
11/08	Workshop	08:30AM	05:00PM			Grid Workshop
11/08	Workshop	01:30PM	05:00PM	406		HPCS Workshop
11/12	Workshop	08:30AM	05:00PM	406		Advancing Research Education
11/12	Workshop	08:30AM	05:00PM	302		APART Workshop
11/12	Workshop	01:30PM	05:00PM	321		Nanoscience Technology & Simulation

Questions? Please send email to: workshops04@sc-conference.org.

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SC Global

Primer

Committee Team

Satellite Site Registration

All SC Global 2004 activities will be open to all conference attendees, including those with Exhibits and Exhibits-only badges. In addition, there will be participation from Global Satellite Sites and Observer Sites. Global Satellite Sites will provide audience interaction from around the world, Observer Sites will allow for passive viewing.

SC Global is accessible to sites running the AG Toolkit. Sites are encouraged to run version 2. In addition, it is possible for Observer Sites to participate in SC Global sessions using a VBrick or Windows Media client. More information will be available about VBrick and Windows Media in the near future. For details about AGTk 2.x, including information about developing software with the Toolkit, please visit www.mcs.anl.gov/fl/research/accessgrid/.

Events						
Date	Event Type	Start Time	End Time	Rm #	Chair	Main Title/Event
11/09	SC Global Showcase	10:30AM	12:00PM	403-405		SC Global Keynote
11/09	SC Global Showcase	01:30PM	03:00PM	403-405		Collaborative Tools
11/09	SC Global Showcase	03:30PM	05:00PM	403-405		Virtual Reality
11/10	SC Global Showcase, Panel	10:30AM	12:00PM	403-405		MSI Consortium Panel
11/10	SC Global Showcase	01:30PM	03:00PM	403-405		Low & High Bandwidth Environments
11/10	SC Global Showcase	03:30PM	05:00PM	403-405		SC2004 Technical

11/11	SC Global Showcase	10:30AM	12:00PM	403-405	Expanding Use: AG
11/11	SC Global Showcase	03:30PM	05:00PM	403-405	Artistic/Cultural Applications

Questions? Please send email to: scglobal04@sc-conference.org.

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HPC Software Challenge

As part of the SC2004 theme of "Bridging Communities", the HPC Challenge has been adapted to bridge the communities of HPC and Software Engineering. This HPC *Software* Challenge will honor participants working to improve the productivity of HPC software developers and the quality of HPC software. The simulations and computations that drive HPC are becoming more complex as are the HPC systems that run them. Software development can become as restrictive a bottleneck as computational intensity. "Coding" must evolve into software engineering to enable software that is not only computationally efficient but also maintainable, extensible, and verifiable.

Submissions. HPC software developers are invited to submit case studies of development processes, strategies, or practices that they have applied to improve developer productivity and software quality. Submissions may cover anything from full life-cycle processes to simple, high-impact techniques, in areas including but not limited to the following:

- Project management
- Requirements definition, analysis, and management
- Configuration management
- Software specification, architecture, and design
- Implementation (coding standards, language subsets)
- Verification (code inspection, testing, formal proof)
- Productivity and quality metrics (collection and analysis)

Submissions are made online at <http://www.sc-submissions.org/>. *The submission deadline is August 2, 2004.* Please include discussion of the following in the submission.

1. The HPC software being developed. Application or library? What does it do? How big is the project? How big is the user base? What is the level of parallelism and scalability?
2. The process, strategy, or practice you employed to improve productivity and software quality. How was it implemented? How much effort did it take? What were the expected improvements?
3. The resulting improvements. Did productivity and/or software quality improve? If so, by how much? Did other problems arise?

Presentations. The submissions will be reviewed by the HPC Software Challenge Committee. Selected submitters will be asked to make a presentation in the HPC Software Challenge session of the Technical Program at SC2004. These presentations will be judged by experts in the fields

software engineering and software development for HPC. Up to *two awards* of \$500 each will be given for presentations considered to have the largest positive impact on HPC software productivity and/or quality. *Note that the largest positive impact may come by disseminating negative results for a given method.* The following factors will be considered.

Improvement Achieved. The documented extent of the effect on productivity and/or software quality.

Innovation. The documented effect from the use of innovative methods.

Return on Investment. Documented benefits achieved relative to the cost of implementing the improvement. (This factor will be ignored when negative results are being reported.)

Credibility. The extent to which results are convincing because they are based on a sound and quantitative analytical design.

HPC Software Challenge Committee

John Goodenough, Software Engineering Institute

Jeremy Kepner, Massachusetts Institute of Technology

Jesse Poore, University of Tennessee

Douglass Post, Los Alamos National Laboratory

Tom Swain, University of Tennessee

James White III (Trey), Oak Ridge National Laboratory, Chair

Currently there are no events listed for this category.

Questions? Please send email to hpc-challenge04@sc-conference.org.

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MSI Outreach

Submission deadline: Applications will be accepted until the program is full.

Submission website: <http://www.sc-submissions.org>

Program Overview

The purpose of this project is to increase the participation of minorities in the SC conferences providing support to help faculty and/or IT professionals from Minority Serving Institutions (MSIs), Hispanic Serving Institutions (HSIs), Tribal Colleges, and Historically Black Colleges and Universities (HBCUs) to attend the conference. It is our intention in providing these grants to improve our ability to reach groups that have traditionally not had access to high performance computing. The SC2004 MSI Program is supported by IEEE Computer Society, ACM SIGAR and SC2004 Conference.

IEEE and ACM fund the SC MSI Participation Grant. The intended impact of this project goes beyond just increasing the numbers of MSI participants in SC conferences to fostering collaborative relationships between faculty at MSIs and research scientists at major research centers and impacting the amount and quality of computational science education at MSIs.

Through this program selected grant recipients will be invited to participate in either the Tutorial Program or Technical program

Grant Application Process:

To apply candidates should complete and submit the SC2004 MSI Grant Application Form. Please note that applicants must be either a US citizen or permanent resident in order to qualify for a grant. Applicants will be notified of their status via e-mail. Applications will be accepted until all spots are filled.

Selection Criteria:

Depending on funding the SC MSI Grant Program will select up to 45 participants. To be considered applicants:

- Must be a faculty or IT professionals from an MSI. (Student not eligible).
- Must be either a US citizen or permanent resident.
- Must be able to attend all MSI-related activities.
- Must be able to complete an SC conference assignment (up to 3 hrs).
- Must present what they have learned at the conference to their colleagues at their home institution.
- Must complete an evaluation of the MSI Program.

- May be required to serve as a mentor to other MSI representatives who have had little exposure to the SC conference.

Financing Participants:

Pending upon funding, up to 45 grants in the amount of \$1,200 will be awarded to those selected to attend SC2004 in Pittsburgh, PA. The conference will be held in the Pittsburgh Convention Center from November 6-12, 2004. Individual grants will reimburse the cost of travel, lodging up to \$1,200. Expenses exceeding \$1,200 will not be reimbursed. In addition to the \$1,200 award, participants will be given a complimentary Conference registration for either the Technical Programs or Tutorials with a one-day pass to the SC Exhibits Hall. The grant award is non-transferable. Grant recipients should allow up to 8 weeks following the conference to receive reimbursement payments.

Reimbursements will be processed upon receipt of SC2004 Travel Expense Report, original receipts and the SC 2004 Survey. The Conference Registration fee will be handled through the budget of the appropriate committee. Detailed travel expense guidelines are available [here](#).

Conference Registration Procedures:

Selected participants will be provided a URL to register via the web, where they will select Minority Serving Institutions (MSIs) as their registration category. Selection of the MSI category will permit them to register for either the Technical Program or Tutorials without having to submit payment information. The selected candidates may pick up their conference materials at the SC2004 Registration Counter beginning Saturday, November 6th at 1:00pm. For additional information contact: Stephenie McLean at mclean@ncsa.uiuc.edu.

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Masterworks Invited Speakers GRID 2004 Awards & Prizes Workshop
SC Global HPC Software Challenge MSI Outreach HPC Bandwidth Challenge

Fifth Annual HPC Bandwidth Challenge

Networks are an integral piece of modern high performance computing. The ability to maximize the network throughput is often essential to the success of high performance computation. The Bandwidth Challenge challenges participants to push the envelope in terms of network throughput as it relates to high performance computing.

For SC2004, SCinet expects to bring 8 OC-192c circuits into the convention center. This kind of bandwidth exceeds the available bandwidth into and out all but the largest countries in the world.

The challenge is to present a real application that requires massive network resources and demonstrate it during SC 2004. The following criteria will be used to judge entries:

1. The sustained throughput
2. The scientific merit or real world applicability of the application
3. The use of innovative and fair TCP and non-TCP implementations
4. The physical distance between involved sites and the associated latency
5. The use of emerging or underutilized technologies such as IPv6 and IP multicast.

The throughput will be verified using high performance monitoring gear, provided by Spirent Communications. Separate awards will be made for the best TCP and the best non-TCP application throughput.

The Bandwidth Challenge is a collaboration between SC, SCinet and Qwest Communications. Qwest Communications is generously providing a monetary prize for the winning entry. This is the fifth annual Bandwidth Challenge. The winning application in last year's Bandwidth Challenge reached 23.21 Gb/s of TCP throughput.

Currently there are no events listed for this category.

Questions? Please send email to bandwidth04@sc-conference.org.

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Education Outreach

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Overview

The theme of this year's education program is "A K-16 Comprehensive Educational Agenda for High Performance Computing." The program will focus on undergraduate faculty and K-12 teachers creating and using local computational science "infrastructures" at their schools and institutions.

In a practice-oriented workshop format, participants will study how to apply high performance computing tools and resources across the curriculum in their specific teaching situations and research interests, as well as how to integrate modeling and visualization techniques into their classroom instruction. Computational scientists will support participants as they identify appropriate tools for the subjects and curricula they teach and the instructional strategies they use. Special emphasis will be given to using high performance computing to promote collaborative learning strategies.

The program will include reviewing existing materials as well as developing new curriculum materials appropriate for classroom instruction. The resulting materials and instructional application will be published on the web for use by other educators. Finally, a follow-up year-long program of workshops, mentoring and resource support will be available to assist teachers as they apply new ideas in practice.

Questions? Please send email to education04@sc-conference.org.

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MSI Outreach

Submission deadline: Applications will be accepted until the program is full.

Submission website: <http://www.sc-submissions.org>

Program Overview

The purpose of this project is to increase the participation of minorities in the SC conferences providing support to help faculty and/or IT professionals from Minority Serving Institutions (MSIs), Hispanic Serving Institutions (HSIs), Tribal Colleges, and Historically Black Colleges and Universities (HBCUs) to attend the conference. It is our intention in providing these grants to improve our ability to reach groups that have traditionally not had access to high performance computing. The SC2004 MSI Program is supported by IEEE Computer Society, ACM SIGAR and SC2004 Conference.

IEEE and ACM fund the SC MSI Participation Grant. The intended impact of this project goes beyond just increasing the numbers of MSI participants in SC conferences to fostering collaborative relationships between faculty at MSIs and research scientists at major research centers and impacting the amount and quality of computational science education at MSIs.

Through this program selected grant recipients will be invited to participate in either the Tutorial Program or Technical program

Grant Application Process:

To apply candidates should complete and submit the SC2004 MSI Grant Application Form. Please note that applicants must be either a US citizen or permanent resident in order to qualify for a grant. Applicants will be notified of their status via e-mail. Applications will be accepted until all spots are filled.

Selection Criteria:

Depending on funding the SC MSI Grant Program will select up to 45 participants. To be considered applicants:

- Must be a faculty or IT professionals from an MSI. (Student not eligible).
- Must be either a US citizen or permanent resident.
- Must be able to attend all MSI-related activities.
- Must be able to complete an SC conference assignment (up to 3 hrs).
- Must present what they have learned at the conference to their colleagues at their home institution.
- Must complete an evaluation of the MSI Program.

- May be required to serve as a mentor to other MSI representatives who have had little exposure to the SC conference.

Financing Participants:

Pending upon funding, up to 45 grants in the amount of \$1,200 will be awarded to those selected to attend SC2004 in Pittsburgh, PA. The conference will be held in the Pittsburgh Convention Center from November 6-12, 2004. Individual grants will reimburse the cost of travel, lodging up to \$1,200. Expenses exceeding \$1,200 will not be reimbursed. In addition to the \$1,200 award, participants will be given a complimentary Conference registration for either the Technical Programs or Tutorials with a one-day pass to the SC Exhibits Hall. The grant award is non-transferable. Grant recipients should allow up to 8 weeks following the conference to receive reimbursement payments.

Reimbursements will be processed upon receipt of SC2004 Travel Expense Report, original receipts and the SC 2004 Survey. The Conference Registration fee will be handled through the budget of the appropriate committee. Detailed travel expense guidelines are available [here](#).

Conference Registration Procedures:

Selected participants will be provided a URL to register via the web, where they will select Minority Serving Institutions (MSIs) as their registration category. Selection of the MSI category will permit them to register for either the Technical Program or Tutorials without having to submit payment information. The selected candidates may pick up their conference materials at the SC2004 Registration Counter beginning Saturday, November 6th at 1:00pm. For additional information contact: Stephenie McLean at mclean@ncsa.uiuc.edu.

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Exhibits

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- Exhibitor Forum**

Overview

Exhibition Hours

Monday 7:00 pm - 9:00 pm (Gala Opening)
Tuesday 10:00 am - 6:00 pm
Wednesday 10:00 am - 6:00 pm
Thursday 10:00 am - 4:00 pm

Exhibition Opening Gala

Monday, November 8

7:00 - 9:00 pm

Celebrate the annual reunion of representatives from many technical communities with interesting conversation, international cuisine, and desirable drinks; while getting a first-hand look at the cutting edge products and technologies that will be on display on the exhibit floor.

SC2004 wishes to recognize Intel Corporation and PathScale, Inc. for their contribution to the Exhibition Opening Gala.

Exhibitor Staff Registration is now open.

Register at: www.sc-conference.org/sc2004/registration.html

This website will remain live throughout the conference. If you are not able to use the Online Exhibitor Registration site, please contact the Registration Center at:

SC2004 Registration Center
11212 Waples Mill Road, Suite 104
Fairfax, VA 22030
Phone: 703-449-6418
Fax: 703-631-7258
Email: scregistration@jspargo.com

Exhibitor Registration Policies & Procedures

Industry Exhibitor Allotment

There is an allotment of 5 badges for each 10 X 10 booth. Once you have exceeded your allotment you must purchase extra staff badges for \$100 each. This fee is collected at the time of registration and will be charged to the credit card on file.

Research Exhibitor Personnel

The badge fee for research exhibitors is \$100. The fee is collected at the time of registration and will be charged to the credit card on file.

How to Register

Online Exhibitor Registration is designed to work with one person-designated the Exhibitor Badge Contact-registering all of the booth staff. When you are ready to start, visit <http://www.sc-conference.org/sc2004/registration.html> and click on Exhibitor Registration. Type your booth number and register yourself as the Exhibitor Badge Contact. A credit card number is required. A credit card will not be charged until Research Exhibitors are entered or the allotment is exceeded for Industry Exhibitors. You will receive an email confirmation that contains your log in and password. Please retain this for your records. You can return to the site at any time to register additional staff. The website is designed to let you know how many staff badges remain in your allotment and how many have been purchased. The credit card on file will be charged for booth personnel related expenses. To purchase additional conference passes or materials additional payment will be required.

Registration Confirmation

Written confirmation will be emailed to the Exhibitor Badge Contact each time you complete an online session. If you do not receive confirmation within 24 hours, please contact the Registration Center: scregistration@jspargo.com.

Technical Program Registrants who are also Exhibitors

Exhibitors who have already registered for the technical program will not count towards your booth limit and will not owe the additional \$100 badge fee. Please check with your staff to confirm their registration status.

Complimentary Technical Program Registration

Each industry exhibitor receives one complimentary technical program registration (this does not include tutorial passport and Grid Workshop registration). Please indicate the staff member to receive the technical program registration by clicking the appropriate box during the online registration process.

Exhibits Only Badges

Exhibits Only Badges (\$80 per day) allow entrance into the exhibit floor for one of the three days of the exhibition: Tuesday, Wednesday, and Thursday. Exhibits Only Badges may be purchased at <http://www.sc-conference.org/sc2004/registration.html>. SC2004 is offering exhibit-only registration to children 12-16 who must purchase Exhibits Only Badges and be accompanied by an adult at all times. Children under age 12 are not permitted on the exhibit floor at any time.

Exhibitor Guest Badges (Industry Exhibitors Only)

The badge contact will have the opportunity to invite guests to the exhibit hall. Industry Exhibitors will receive 50 guest passes per 10x10. To invite your guests click on "Invite Guests to the exhibit booth at Supercomputing 2004!" You will simply submit the name and email address of each guest and we will invite them on your behalf. Each invited guest will have the option to choose an exhibit hall pass for Monday, Tuesday, or Wednesday. You will be able to track your guests the same way you track your booth personnel. This will be available beginning July 30, 2004.

Please note: These badges are intended by use for your clients! Exhibiting companies who submit these forms onsite will be charged \$80 per person.

Written requests for cancellations and substitutions will be processed. **Cancellations are subject to a \$80 fee.**

to a \$25 processing fee. *No-shows are billed in full.*

Missing and Lost Badges

There is a \$40 charge to replace missing or lost badges.

Registration and Store Hours

Saturday 11/6 1 pm – 6 pm

Sunday 11/7 7:30am – 8 pm

Monday 11/8 7:30am – 8 pm

Tuesday 11/9 7:30am – 5 pm

Wednesday 11/10 7:30am – 5 pm

Thursday 11/11 7:30am – 5 pm

Friday 11/12 8 am – 11 am

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StorCloud

Contributors **Architecture** **Allocations** **Applications**
Challenge **Committee**

STORCLOUD: A High Bandwidth Storage Area Network Initiative

StorCloud, a **new initiative** this year, builds a High Performance Computing (HPC) storage capability to showcase HPC storage technologies (topologies, devices, interconnects). StorCloud “storage on request” area network capability, comprised of state-of-the-art heterogeneous devices and technology, supports researchers and demonstrates high bandwidth applications.

StorCloud provides:

- a showcase for evolutionary and revolutionary HPC storage technologies in a heterogeneous environment
- one PetaByte of randomly accessible storage to SC2004 participants
- one TeraByte per second infrastructure bandwidth
- one GigaByte per second backup bandwidth
- a leverage for SCinet infrastructure
- a management and allocation resource facility for SC2004 participants.

Storage, file system and software vendors contributed equipment and expertise to this initiative. Storage equipment is attached and assigned to host platforms throughout the convention as requested. Host platforms will partition, format, and use the storage as needed. Sharing devices are also accommodated between cooperating parties. StorCloud is architected and deployed entirely by volunteers from government, industry and academia. It combines state-of-the-art mechanisms, storage devices, and control/management software to provide an extreme storage capability to conference exhibitors. Additionally, StorCloud is hosting an applications competition: the StorCloud Challenge. Teams are given time, space and bandwidth to demonstrate their high bandwidth applications using StorCloud. For more information on the StorCloud initiative, contact the committee at storcloud04@nacse.org.

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InfoStar

InfoStar is a new SC special initiative whose goals are to: (1) provide real-time information about multiple aspects of the conference to all participants, and (2) create a searchable knowledge about conference events and attendance for the benefit of future SC conference planners.

Technical program participants will be able to obtain daily information about each session, including updated information about each presentation and speaker bios and notes when available. Session organizers and exhibitors will have upload rights to provide updated information about each session to all InfoStar users. With this new InfoStar capability the days of attending an SC session with outdated information will be a thing of the past. Exhibit-goers will have up to the minute information about each booth and vendor on the show floor. Exhibitors will have upload rights to InfoStar to provide customized information about activities in their booth to conference attendees each day. Committee members will have access to historical record data from registration and attendance information.

InfoStar combines multiple data sources, wireless communications, collaborative software, and innovative data clustering and visualization technology to provide conference attendees with unprecedented access to SC conference information on a real-time basis. InfoStar also makes it possible for exhibitors and SC2004 planners to upload new information throughout the conference to keep attendees up to date about activities and events at the click of a button. Information is delivered quickly and conveniently over the SCinet wireless (or wired) network.

Behind the scenes InfoStar will be building an extensive historical record of conference registration and attendance information that will prove valuable for future SC planning purposes. InfoStar's features are summarized below.

Capabilities

- Interactive maps
- Visual cues of similar functions and events
- Full view capabilities on desktops, wired or wireless laptops or tablet PCs
- Special features for optimal viewing on wireless-enabled Windows mobile-based PocketPCs and BlackBerry handhelds.

Access during SC2004

- Exhibitor and booth information, including special events
- Technical program information (agendas, speaker bios, special notes)

- [Education program information](#)

InfoStar was developed by a volunteer team of information and knowledge-management experts. For more about the InfoStar team, go to the [InfoStar home page](#).

Questions? Please send email to: infostar04@sc-conference.org.

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Infrastructure

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[Transportation](#)

Overview

Thank you for visiting the SC2004 web site.

Information for this page will be posted as it becomes available, so please visit often. The [Call Participation](#), which contains an overview of all elements of the conference, is available as a PDF for easy downloading and should answer any questions you may have at this time. If not, a contact list is provided here for your convenience.

Don't forget to click on the "Latest News" button on the home page regularly so you can stay up to date on what's being planned for the conference. We have some new as well as exciting things planned this year, so don't miss out. Topping the list is Pittsburgh's all-new convention center, the first certified "green" convention center in the United States, with triple the space of the old center. Check it out at www.pittsburghcc.com.

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SCinet Networking

SCinet

Attention SC2004 Exhibitors!

For more information,
to request a SCinet network connection,
or to manage your SCinet account
please visit: <http://scinet.supercomp.org/>.

SCinet is the collection of high-performance networks built to support the annual International Conference for High Performance Computing and Communications (SC). The SC Conference Series is co-sponsored by ACM SIGARCH and the IEEE Computer Society. SCinet features a high-performance production-quality network and an extremely high performance experimental network, Xnet.

Volunteers from educational institutions, high performance computing centers, network equipment vendors, research networks, and telecommunication carriers work together to design and deliver the SCinet networks. Industry vendors and carriers donate much of the equipment and services needed to build the LAN and WAN infrastructure. Planning begins more than a year in advance of each SC Conference and culminates with a high-intensity installation just 7 days before the Conference begins.

In partnership with Qwest Communications, Level(3) Communications and MCI, SCinet is providing direct wide area connectivity to Abilene, DREN, ESnet, TeraGrid, and to many national and worldwide networks through peering relationships with these principal networks. In addition, SCinet is working with the National Lambda Rail to provide very high bandwidth transit for several national optical network testbeds into Pittsburgh. Aggregate WAN transport delivered to the Industry and Research Exhibitors is expected to exceed 80 billion bits/second (Gbps). Duquesne University Communications is providing invaluable access to dark fiber in the Pittsburgh Metropolitan Area.

Network Performance Monitoring

The SCinet architecture incorporates a number of features that support network monitoring. Monitoring will be used both to watch the internal network for operational purposes and to characterize the high-performance network applications that traverse SCinet, in particular for the Bandwidth Challenge.

Utilization and errors for all external links, and all major SCinet internal links will be monitored

operational purposes. Active techniques will be used to monitor reachability over the external and latency to key sites. Internet2® in conjunction with SCinet will provide a "weather map" showing current utilization on all SCinet external links, based on the technology used for the Abilene NOC weather map, developed by the Abilene NOC at Indiana University. Spirent Communications will provide Adtech AX/4000s to passively monitor each wide area connection and collect statistics. These statistics will include total aggregate traffic counts on each of the connections and total instantaneous traffic counts for use in judging the Bandwidth Challenge data (e.g, NetFlow, cflow) will be collected from routers and visualized using FlowScan, a tool developed by Dave Plonka at the University of Wisconsin at Madison.

Network Security

The design characteristics that define the SCinet production networks include high bandwidth latency, resiliency, and scalability. SCinet peers with the Internet, Agency, and National wide networks through a series of very high-speed connections. To maximize performance across interfaces, there are no firewalls. In this regard, the SCinet network is a logical, albeit temporary, extension of the open Internet. Exhibitors and Attendees are reminded that, in this potentially open environment, network security is a collective responsibility.

Exhibitors who use insecure communications methods are exposing their networks and systems to compromise. The use of insecure applications including TELNET and FTP is strongly discouraged. These applications are subject to compromise because they send passwords to remote hosts in human readable, clear text format. Attendees are strongly encouraged to protect their sessions through a mechanism such as Secure Shell (SSH), where all communication is encrypted. SSH implementations are available for little or no cost and are straightforward to install and use. Each Attendee is responsible for ensuring that their communications sessions are protected in accordance with their security requirements.

All IEEE 802.11a, 802.11b, and 802.11g wireless networks, including those provided by SCinet, are vulnerable by their very nature. The ease of use that makes them attractive is the same feature that is most easily exploited. Wireless networks are open to unauthorized monitoring or snooping by anyone within range of an access point.

SCinet will monitor traffic on most external network connections as part of routine network performance monitoring activities. In addition, SCinet has a restricted capability to monitor Exhibit floor, wireless network and external network traffic for evidence of security-related activity including compromise or abuse. However, by no means should this coverage be considered a substitute for safe security practices. Please do your part by being cognizant of network security risks and protecting your systems and sessions.

Wireless Network Services

In collaboration with Trapeze Networks, SCinet will deploy IEEE 802.11a, 802.11b and IEEE 802.11g wireless networks within the David L. Lawrence Convention Center. These wireless networks are part of the production SCinet network, providing access to the Internet, and many other National and Agency networks. The wireless network will be provided on the Exhibit Floor, the Education Program areas, the Ballroom and meeting rooms, and in many common areas of the David L. Lawrence Convention Center.

SCinet provides the wireless networks for use by all Exhibitors and Attendees at no charge. Please refer to the wireless coverage diagram available at the SCinet NOC for specific coverage.

information for both networks. Known wireless network limitations, such as areas of reduced strength, limited client capacity, or other coverage difficulties will be described with additional signage at appropriate locations throughout the David L. Lawrence Convention Center.

IP settings including IP and DNS addresses for wireless clients are automatically provided by SCinet via DHCP. Laptops and other wireless devices configured to request network configuration information via DHCP receive this information automatically upon entering the SCinet wireless coverage area. Wireless devices must conform to the IEEE 802.11a, 802.11b or 802.11g standards. Please refer to <http://www.weca.net/> for more information.

SCinet will monitor the health of the wireless networks and maintain this information for Exhibitors and Attendees. The wireless networks are governed by the SCinet Service Level Policy posted on the SCinet public web site at <http://scinet.supercomp.org>. In summary, while every practical effort shall be made to provide stable reliable network services, there is no explicit service level agreement for any SCinet network, including the wireless networks, nor are there any remedies available in the event that network services are lost.

In order to provide as robust a wireless service as possible, SCinet must control the entire 2.4 and 5.2GHz frequency radio spectrum (2.412GHz-2.462GHz) and (5.15GHz to 5.35GHz) within the David L. Lawrence Convention Center. This has important implications for both Exhibitors and Attendees:

Exhibitors and Attendees may not operate their own IEEE 802.11a, 802.11b, or 802.11g wireless Ethernet access points anywhere within the David L. Lawrence Convention Center, including their own booth. Wireless clients may not operate in ad-hoc or peer-to-peer mode due to the potential for interference with other wireless clients. Exhibitors and Attendees may not operate 2.4GHz or 5.2GHz cordless phones. Exhibitors and Attendees may not operate 2.4GHz wireless video or security cameras, or any other equipment transmitting in the 2.4GHz or 5.2GHz spectrum.

SCinet wants you to have a successful, pleasant experience at SC2004. This should include the ability to sit down with your wireless-equipped laptop or PDA and check e-mail or surf the Web from anywhere in the wireless coverage areas. Please help us achieve this goal by not operating equipment that will interfere with other users. SCinet will actively police both the 2.4GHz and 5.2GHz frequency spectrums and reserves the right to disconnect any equipment that interferes with the SCinet wireless networks.

Xnet

Xnet (eXtreme Net) provides a venue to showcase bleeding-edge, developmental networking technologies and experimental networking applications.

The SCinet Exhibit floor network has evolved into a robust, high-performance, production-quality network that Exhibitors and Attendees depend on for reliable local area, wide area, and commercial network service. Consequently, it has become increasingly difficult for SCinet to showcase bleeding edge, potentially fragile technology. Simultaneously, OEMs have at times been reticent about showcasing bleeding-edge hardware in SCinet, as it became a mission critical, production network.

Xnet provides the solution to this dichotomy by providing a venue which is by definition bleeding-edge, pre-standard, and in which fragility is understood. Xnet thus provides vendors and researcher exhibitors an opportunity to showcase emerging network gear or capabilities, prior to their general commercial availability.

Xnet debuted in Portland, OR at SC'99, where Dense Wavelength Division Multiplexing (DWDM) technology was used in the implementation of OC-48 SONET rings on the conference show floor. At SC2000, Xnet demonstrated pre-production and early delivery 10-Gigabit Ethernet equipment connecting several exhibit floor booths. The SC2001 Xnet expanded the deployment of 10 Gig Ethernet using equipment from several vendors and using 10 Gigabit Ethernet in several Bancor Challenge Applications. In Baltimore at SC2002, with 10-Gigabit Ethernet a commodity and the telecom industry focused on survival, Xnet took a sabbatical. 2003 provided opportunities to evaluate early next generation optical switching technologies and consider special purpose optical network testbeds. In 2004, Xnet returns with a focus on advanced optical switching and new transport technologies. Please refer to materials available at the time of the conference for additional information.

Service Level Policy

The Network Committee, SCinet, provides commodity Internet, research, and experimental networks for use by the Exhibitors and Attendees. While every practical effort shall be made to provide stable and reliable network service on each network, there is no explicit service level agreement for any SCinet network, nor are there any remedies available in the event that network services are lost.

SCinet provides a series of networks each year for use by the Exhibitors and Attendees. Each network can be broadly categorized as Commodity Internet, Research, or Xnet infrastructure. In addition, there are significant peering relationships among these networks that allow them to communicate.

Commodity Internet networks include the high bandwidth connection from the convention center to one or more Internet Service Providers, and both wired and wireless networks that connect the exhibit halls, meeting rooms, ballrooms, mail rooms, and other common areas to the Internet.

Research networks include very high bandwidth connections to National and Agency networks including Internet2, ESnet, DREN, and TeraGrid. Coupled with the extensive peering relationships that these networks have with other research networks worldwide, SCinet can engineer connections to virtually any public IP address in the world. Access to these networks is limited to Exhibitor network connections to the SCinet core.

Xnet networks are typically experimental and often fragile. These networks connect small numbers of devices at extremely high bandwidth using equipment that is pre-production, pre-standard, research oriented. In most cases, Xnet networks do not peer with other networks to reduce potential network volatility.

Supporting Organizations

The success of SCinet depends on a great number of people. We would like to recognize the following companies, organizations, and institutions for their support for SCinet in 2004: Aarog Group, Aeronautical Systems Center MSRC, Argonne National Laboratory, California Institute of Technology, Cisco Systems, Computer Sciences Corporation, Duquesne Communications, East Carolina University, ESnet, Florida State University, Force10 Networks, Foundry Networks, Indiana University, Abilene/Internet2, Juniper Networks, Lawrence Berkeley National Laboratory, Los Alamos National Laboratory, Marconi, Mid-Atlantic Crossroads - MAX GigaPOP, National Center for Supercomputing Applications, National Lambda Rail, Nortel, Oak Ridge National Laboratory, Pacific Northwest National Laboratory, Pittsburgh Supercomputing Center, Purdue

University, Qwest, San Diego Supercomputer Center, Sandia National Laboratories, SARA, Spirent, Trapeze Networks, University of Florida, University of Mannheim, U.S. Army Research Laboratory, U.S. Army Space & Missile Defense Command Simulation Center

Questions? Please send email to: scinet04@sc-conference.org.

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