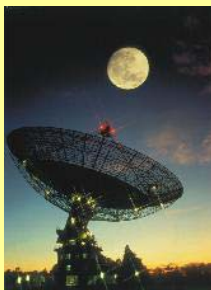


PC Grid Computing with



Grid Computing allows the sharing of a range of computer resources, from the humble low-end PC through clusters of computers to supercomputers. Indeed, through the aggregation of a huge number of PCs, it is possible to obtain the computing power of a supercomputer. This is typically referred to as PC Grid Computing. The most visible types of PC Grid Computing projects currently are the volunteer projects where the public or organizations contribute compute resources to solve a worthy challenge.

Participation in such projects typically involves downloading a client software that runs on the PC as a screensaver. When a PC is idle, the screensaver is activated and it requests a task from its master server. Results are returned to the master server upon completion of computation and another task gets dispatched to the PC.



The more prominent public PC Grid projects is SETI@home, which uses a PC Grid of large numbers of Internet-connected computers to search for extra-terrestrial intelligence through analysis of data collected from radio telescopes aimed at outer space. Radio telescope signals consist primarily of noise (from celestial sources and the receiver's electronics) and man-made signals such as TV stations, radar, and satellites. As more compute resources increases the cover of frequency ranges and improve sensitivity, this application has a huge appetite for compute power, which makes it a suitable candidate for a public PC Grid project.

The SETI@home project is powered by the Berkeley Open Infrastructure for Network Computing (BOINC). This is the middleware or "glue" that holds the PC Grid together. BOINC is being developed at UC Berkeley Spaces Sciences Laboratory by the group that developed and continues to operate SETI@home. BOINC is open-source and is available at <http://boinc.berkeley.edu>. Other projects that are powered by BOINC include predictor@home, folding@home and climateprediction.net.

More BOINC ...

What does this mean to you? Besides participating in such projects by contributing compute resources, you can explore PC Grids to tap onto the spare cycles of the PCs in your organizations.

An excellent opportunity is just round the corner to learn more about BOINC from its lead developer, Dr. David Anderson. He will be conducting a tutorial on BOINC on 16 May 2006, as part of GridAsia 2006. This tutorial will teach you to use BOINC to create a volunteer computing project, like SETI@home, that uses thousands or millions of computers to do scientific computing. In addition, the tutorial provides a good opportunity for further exchanges between the Singapore and BOINC projects, towards future collaboration and interoperability. Do sign up at the GridAsia 2006 website: <http://gridasia.ngp.org.sg/2006>



Make A Date With ...

National Grid Distinguished Speaker - 1

Title: **Systems Level Science and the Role of Cyber-infrastructure**

Prof. Carl Kesselman, Director of the Center for Grid Technologies at the University of Southern California in USA, will deliver a lecture on 15 May 2006 in the School of Accountancy auditorium, Singapore Management University, at 1600 hours.



The emergence of e-Science or Cyber-infrastructure can have a profound impact on the scale and breadth of scientific inquiry. By flexibly combining distributed networks, computers, storage, databases, services and instruments, disciplines such as oceanography, geosciences, high-energy physics and biology are starting to take a systems oriented approach to understanding a broad range of phenomena. We see a new mode of science emerging, based on distributed, computationally enabled collaborations: systems level science. Such system level explorations by their nature require a broad range of skill sets, participants and resources. Dr. Kesselman will introduce the ideas of systems science and explore the types of information technology infrastructure required to support this type of distributed, collaborative scientific exploration. In particular, he will focus on the mechanisms needed to create and operate distributed virtual communities within the context of our information technology infrastructure.

National Grid Distinguished Speaker - 2

Title: **Grid Computing in the Enterprise**

Kevin Walsh, Senior Vice President for R&D at Oracle Corporation, will speak on on 17 May 2006 in the School of Accountancy auditorium, Singapore Management University, at 0900 hours as part of the Opening Ceremony of the GridAsia 2006.



Grid-based "computing as utility" is poised to take off. Grid Computing achieves a balance between the benefits of holistic resource management and flexible independent resource control encompassing infrastructure, Applications and Information Grid. Learn how's Oracle is making it possible. The ideas of Grid Computing are aligned with capabilities and technologies Oracle has been developing for years are led by the vision where Grid Computing could lead in the future. Oracle provides substantial grid computing technology that can help you capitalize on the grid and within reach of even the most cost-conscious business today. IT organizations can now build dynamic industry-standard grid systems well-suited to meet the rapidly shifting needs of the business.

Interested to attend? Please register your interest at gridasia.ngp.org.sg.

Platform Computing Workshop @ GridAsia 2006

Platform Computing - the world's leading provider of Grid Computing solutions and a pioneer in the deployment of the world's first production grids invites you to join us at GridAsia 2006 for a full day of technology track sessions. Discover how Grid computing is delivering real business value to Fortune 2000 organizations. Learn from industry experts about the latest developments in Enterprise Grid computing in a wide range of markets, including: Electronics, Financial Services, Government, Life Sciences and Education. Find out more about Platform Enterprise Grid Orchestrator (EGO) - the first and only Grid platform that delivers the power of virtualization, automation and sharing of all IT resources to every enterprise application type. Utilizing a resource orchestration product such as Platform EGO enables IT to allocate resources with real-time changes at the speed of business demand. The agenda features many top-quality sessions as well as extensive opportunities for networking. Please visit the website at <http://www.ngp.org.sg/gridasia/2006/programplatform.html> for more details.

National Grid Seminars for the Layman

Together with the National Library Board and the Imperial College Alumni Association (Singapore), and supported by the Singapore Computer Society, the National Grid Office launched a new lecture series, branded as "Grid Is Good: Unleashing Grid Computing To Power Business, Education & Life". The title is a spin on Michael Douglas' line "Greed is good" in the movie, *Wall Street*.



08 Apr 2006 'Grids for Business for Real'

by Ong Guan Sin (Singapore Computer Systems)
at 3pm in Visitors' Briefing Room, Level 1, NLB Building, 100 Victoria Street.

Grid has been touted as the next big thing after the internet. Grid Computing began in the laboratories, but the adoption of Grid in the commercial world has been gaining steadily in recent years. What benefit does Grid bring to the businesses and how can industry reap the benefits of Grid? What are the pitfalls to avoid and what are the best practices to adopt? This talk will provide use cases of Grid in the enterprise and paint scenarios of how Grid can evolve to embrace the business world and vice versa.

15 May 2006 'A Million Years of Computing'

by Dr. David P. Anderson (Space Sciences Laboratory, UC Berkeley, USA)
at 7pm pm in the Visitors' Briefing Room, level 1, NLB Building, 100 Victoria Street

Suppose you're a scientist who uses computers. You've developed a great new program that will revolutionize your research. But you then test your program and discover that it will take a million years to run. Of course, that's impossible - better give up and start over. Right? Not so fast. A new computing paradigm may be able to help. In this approach, called 'volunteer computing', computer owners donate the use of their PCs to scientific research projects. If you can find a million volunteers, and can divide your work into a million separate parts, the job can be finished in one year, not one million.

Volunteer computing is now being used by scientists in many areas, including physics, chemistry, biology, earth science, and mathematics. The BOINC project, based at the UC Berkeley Space Sciences Laboratory, is developing software that makes it easy for scientists to create volunteer computing projects, and for computer owners to participate in these projects. This talk will discuss BOINC and some of the projects using it.

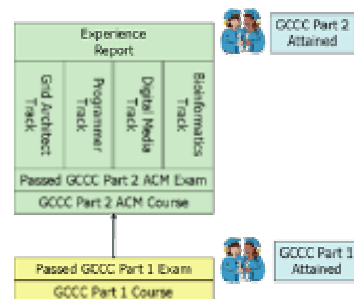
Grid Computing Competency Certification

In October 2005, the Grid Computing Competency Certification (GCCC) program was launched to provide a benchmark for competency in Grid Computing. It helps to develop capabilities of the Infocomm professionals in Grid Computing to enable them to meet the needs of the industry. The National Grid Office is the certification body for the GCCC and has established the GCCC Committee, comprising representatives from institutes of higher learning, for the management and administration of GCCC.

The GCCC consists of 2 parts. Part 1 certification has been accredited by the National Infocomm Competency Centre. It aims at ensuring that the attendees attain a minimum body of knowledge in Grid Computing. Singapore Polytechnic has been appointed as the training service provider for Part 1.

Contact Person:

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GridAsia 2006

... is jointly organized by Agency for Science, Technology And Research, Infocomm Development Authority, Nanyang Technological University, National Grid Office, National University of Singapore, and Singapore Management University.



Highlights ...

GECON 2006

3rd International Workshop on
Grid Economics &
Business Models



16 May 2006 (Tuesday), 0900 - 1800 hrs
Conference Hall 2 , Level 2, School of Accountancy, Singapore Management University
<http://www.ngp.org.sg/gridasia/2006/gecon.html>

Following the success of the first two workshops held in Seoul (Korea), GECON 2006 invites researchers and practitioners to present and discuss the Grid Economics and Business Models, with particular emphasis on the operational and deployment issues.

Grid computing systems utilize the heterogeneous networked resources (computation, information, database, storage, bandwidth, etc.) through the Internet. The systems can operate in predefined and organized ways or form the collected resource systems through self-organizing and decentralized ways. Even with the various types of abundant resources in the Internet, the resources that can be organized and operated in the presence of multiple resource owners with the uncertainty of resource availability and quality are scarce.

Therefore, managing and operating such scarce resources in the Grid systems would bring the need of the economy which will value the need and availability of various types of resources. The creation of stable and scalable economy will support the successful deployment and operation of Global Grid systems in the Internet. This Third International Workshop on Grid Economics and Business Models invites the researchers and practitioners from multiple disciplines to discuss the economy of these systems in concern focusing on the operational and deployment issues of Grid Economy.

The program of GECON 2006 will comprise invited talks, presentations, and discussions by both the research and industry communities.

**Join us to learn from leading Grid
experts & practitioners at GridAsia
2006!**

GECON PROGRAM

Suggestions for Grid Commercialization Strategies

Private to Public Grids (Invited paper)
Richard Croucher (Sun Microsystems)

EGG: An Extensible and Economics-Inspired
Open Grid Computing Platform (Invited paper)
David C Parkes (Harvard University, USA)

GridASP Toolkit: An ASP Toolkit for Grid Utility
Computing
Satoshi Itoh (Grid Technology Research Centre,
AIST, Japan)

Grid Economy Test-beds & Operation

Evaluating Demand Prediction Techniques for
Computational Markets (Invited Paper)
Kevin Lai (HP Labs Palo Alto, USA)

Experimental & Empirical Perspectives on Grid
Resource Allocation for the Singapore Market
Steve Miller (Singapore Management University)

An Evaluation of Communication Demand of
Four Auction Protocols in Grid Environments
Marcos Dias de Assuncao (University of
Melbourne, Australia)

Adaptive Self-Optimizing Resource Management
for the Grid
Chen-Khong Tham (National University of
Singapore)

Pricing, Charging & Accountancy Issues of Heterogeneous Resources

Tariff Structures for Pricing Grid Computing
Resources (Invited paper)
Hemant Bhargava (UC Davis, USA)

Pricing Substitutable Grid Resources using
Commodity Market Models
Gunther Stuer (University of Antwerp, Belgium)

Are Utility, Price, and Satisfaction Based Resource
Allocation Models Suitable for Large-Scale Distributed
Systems?
Xin Bai (University of Central Florida, USA)

Grid Market Framework

Internet Resource Economics – The Intersection
between Grid Economics and Information Economics
(Invited paper)
Chris Kenyon

Challenges in Designing Grid Marketplaces (Invited
paper)
Ramayya Krishnan (Carnegie Mellon University, USA)

The Analysis for the Trust Policy of Grid System
Based on Agent Based Virtual Market Simulation
Junseok Hwang (Seoul National University, Korea)

A Market-Based Framework for Trading Grid
Resources
Song Jie (APSTC, Sun Microsystems, Singapore)

Published by the National Grid Office (NGO). The mission of the National Grid in Singapore is 'to facilitate the seamless use of an integrated cyber-infrastructure in a secure, effective and efficient manner to advance scientific, engineering & bio-medical R&D, with the longer goal of transforming the Singapore economy using the Grid.'

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