



Meeting on e-Science & Grid Computing

Date	31 January 2007 (Wednesday)
Time	1530 – 1830 hours
Place	The Big One, I2R Building, 21 Heng Mui Keng Terrace, Singapore 119613
1530 – 1600	Registration & Coffee
Chair: Dr. Lee Hing Yan (National Grid Office)	
1600 – 1615	Desktop Grid Enabled Symbiotic Simulation for Aerospace Virtual Warehouse Dr. Malcolm Low Yoke Hean (NTU)
1615 – 1630	UK-Pan Asia BioGrid Initiative using OMII Framework, myGrid & Taverna Assoc. Prof. Tan Tin Wee (NUS)
1630 – 1645	Making Sense from Sensed: Integrating the GRID with miniature wireless sensor Specks Dr. Steven Wong Kai Juan (NTU)
1645 – 1700	Market Models for the Commoditized Trading of Grid Resources & Services Practice Prof. Steven Miller (SMU)
1700 – 1715	Coffee/Tea
Chair: Christopher Tan (British High Commission in Singapore)	
1715 – 1730	Building High Quality Pipelines for Comparative Sequenome Annotation using Grid Technologies Darran Nathan (Progeniq Pte Ltd)
1730 – 1745	- MediaGrid – High Performance Distributed Visualization Services - Orthopedic Surgery Training in 3-Dimensional Shared Virtual Environment Assoc. Prof. Alexei Sourin (NTU)
1745 – 1800	TBA (via Access Grid) Dr. Amornrat Phongdara (Prince of Songkla University, Thailand)
1800 – 1815	Discussion
1815 – 1830	Closing Remarks

Jointly Organized by:



UK-Singapore Partners in Science Meeting on e-Science & Grid Computing 31 January 2007 (Wednesday)

The 1st UK-Singapore Partners in Science Workshop was held in conjunction with GridAsia 2006 to create an opportunity for British companies and researchers to present e-Science projects and to explore avenues for collaboration. Since then, there have been subsequent discussions via the Access Grid sessions. Through the funding of travel support, some 15 researchers were able to visit their UK counterparts and/or attended the UK e-Science All-Hands Meeting in Nottingham, where the 2nd UK-Singapore Partners in Science Workshop was held.

This meeting has been organized for the Singapore researchers to share the joint proposals that have evolved and to take the collaboration to the next level.

The program of the presentations has been organized in the order the submissions were received from the Principal Investigators.

Project Title: **Desktop Grid Enabled Symbiotic Simulation for Aerospace Virtual Warehouse**

PI: Dr. Malcolm Low Yoke Hean (NTU)

Collaborator (local): Dr. Peter Lendermann (SIMTech)

Collaborator (UK): Dr. Simon Taylor (Brunel University)

Project Title: **UK-Pan Asia BioGrid Initiative using OMII Framework, myGrid and Taverna**

PI: Associate Prof. Tan Tin Wee (NUS)

Collaborators (local):

- Dr. Lane Shen (NTU)
- Prof. Robert Gay (NTU)
- Dr. Miao Chunyan (NTU)
- Dr. Christopher Baker (I²R)

Others (local):

- Lim Teck Sin (KOOPrime Pte Ltd)
- Darran Nathan (Progeniq Pte Ltd)
- Ong Guan Sin (Singapore Computer Systems Ltd)

Collaborators (UK): - to be invited

- Prof. Carole Goble (Manchester University)
- Tom Oinn (European Bioinformatics Institute)
- Dr. Robert Sinnott (NeSc, Glasgow University)
- Neil Chue Hong (NeSc, Edinburgh University)

Abstract

Using the OMII framework, we propose to use the combination of OGSA-DAI (myGrid) and GUI user interface applications (Taverna) platform and the future BPEL/Sedna, to set up and build a UK-PanAsia BioGrid. This will be based on emerging Semantic Web standards for resource discovery and intelligent knowledge based computation. This infrastructure will support specific projects unique to contemporary ASIAN themes, such as Influenza database, Viral vaccine development (e.g., Dengue) and more generic goals such as semi-automated curation of databases (UK/ASIAN), an ontology based universal database registry service, SOA, and rapid database distribution using high performance bandwidth for national repository nodes.

P2P distribution methods for Secondary institutional repository nodes at narrow bandwidth localities will also be incorporated.

More exploratory research investigations will focus on the feasibility of deploying formal Reasoning services on Grid infrastructure, taking into account scalability and complexity of the required algorithmic computation.

Project Title: **Making Sense from Sensed: Integrating the GRID with miniature wireless sensor Specks**

PI: Dr. Steven Wong Kai Juan (School of Computer Engineering, NTU)

Collaborators (local): Associate Prof. Francis Lee Bu-Sung (School of Computer Engineering, NTU)

Collaborators (UK): The Speckled Computing Consortium

Principal Investigator: D.K Arvind (School of Informatics, University of Edinburgh)

Co-Investigators: Alan Miller (University of St. Andrews)
Ben Paechter (School of Computing, Napier University)
Bob Stewart (EEE Dept, University of Strathclyde)
Iain Thayne (EEE Dept, University of Glasgow)

Abstract:

Wireless sensor networks have been an area of intensive research for the last couple of years with advancements achieved in the areas of hardware development, communications, middleware, networking and applications. Sensor nodes had been deployed to monitor environments such as in the case of disaster detection, security applications, health care, animal tracking, etc. Each sensor nodes contains little processing and memory capacities, and depending on deployment, energy resources could also be limited. These constraints were further tightened with the miniaturization of these sensor nodes, such as in the case of the Specks. Specks are wireless sensor nodes that would have a footprint of less than 5x5x5mm and a network of Specks is known as Specknets. The task of distributed information processing within a Specknet is known as Speckled Computing. Due to their minute sizes and short communication ranges, Specks are intended to be deployed in the thousands and would allow environments to be sensed with higher granularity as compared to current sensor nodes. However, this also creates the need to handle large amounts of information as well as coordination among the Specks to support real-time evaluations of the sensed environment. Given the energy, processing and memory constraints of each Speck, the computational load for the Specknet would be enormous. Thus, the goal of this research is to explore the feasibilities and platforms for offloading some of the computationally-expensive tasks from the Specknet to a more powerful computing platform such as the GRID in a closed-loop fashion. The aim is to exploit the vast computing resources available on the GRID to complement the local processing performed via Speckled Computing such that the intended environments could be monitored using Specknets in a highly energy-efficient and accurate manner.

Project Title: **Market Models for the Commoditized Trading of Grid Resources and Services**

PI: Practice Prof. Steven Miller (Dean, School of Information Systems, SMU)

Collaborators (local):

- Danny Oh (PhD student, School of Information Systems, SMU)
- Asst. Prof. Cheng Shih-Fen (School of Information Systems, SMU)
- Dr. Simon See (Asia Pacific Science & Technology Centre, Sun Microsystems)

Collaborators (UK):

- Prof. John Darlington (Director, Internet Centre, Imperial College London)
 - Jeremy Cohen (Technical Coordinator, Internet Centre, Imperial College London)
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Project Title: **Building High Quality Pipelines for Comparative Sequenome Annotation using Grid Technologies**

PI: ??

Collaborators (local):

- Associate Prof. Bertil Schmidt (UNSW Asia)
- DT Singh (Genvea Biosciences Pte Ltd)
- Darran Nathan (Progeniq Pte Ltd)

Collaborators (UK):

- Associate Prof. Omer F. Rana (University of Cardiff)
 - TBA (European Bioinformatics Institute)
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Project Title: **Orthopedic Surgery Training in 3-Dimensional Shared Virtual Environment**
(Submitted to NMRC as Individual Research Grant proposal)

PI (local): Associate Prof. Alexei Sourin (NTU)

Collaborators (local):

- Farid Kagda (NUH)
- Olga Sourina (NTU)
- Vitai Zagorodnov (NTU)

Collaborator (UK): Nigel John (University of Wales, Bangor)