Computing and Information Grid Development in Thailand

Sornthep Vannarat
NECTEC
OUTLINE

- Snap shot of CSE in Thailand
- Grid Infrastructure development
- Information Grid Initiative
Snap Shot of CSE Thailand

Annual National Symposium of Computational Science and Engineering (ANSCSE)
Number of Papers

Computational Chemistry and Biology
High Performance Computing and Numerical Analysis
Computational Physics and Fluid Dynamics
Computational Fluid Dynamics and Mechanics
Total
Number of Authors

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<th>#Yrs</th>
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Number of Authors 773
Number of Papers 553
Ratio 1.4
Keywords

- Out of 553 papers, there are:
  - Method Development(8%), Fundamental Chemistry(7%),
  - Environment(5%), Computational Fluid Dynamics(5%), HIV(5%), Space(5%),
  - Molecular Dynamics(4%),
  - Fluid(3%), Magnetism(3%), Tool Development(3%), Fundamental Physics(3%), Parallel Computing(3%), Genetic Algorithm(3%), Material Processing(3%), Transport Phenomenon(3%),
Keywords (2)

- Out of 553 papers, there are:
  - Image Processing (2%), Cluster Computing (2%), Computer Recognition (2%), Medical (2%), Fundamental Mathematics (2%),
  - Neuron Network (1%), Distributed Computing (1%), Polymer (1%), Solid State Physics (1%), Bioinformatics (1%), Alloy (1%), Number System (1%), Crystal Growth (1%), Visualization (1%), Silicalite (1%), Nanoscale (1%), Ising Model (1%), Heat Transfer (1%), Grid Computing (1%), System Control (1%), Heme (1%), Zeolite (1%), Optimization (1%), Ocean (1%), MBE (1%), Material Strength (1%), Circuit Design (1%), Semiconductor Device (1%), Structure Analysis (1%), Chaotic System (1%), VLSI (1%)
Keywords summary

- Biology and Bio-medical
  - HIV, Malaria, SARS, BirdFlue
  - BioInformatics

- Materials Science and Engineering
  - Materials design and development
  - Computational Mechanics
  - Computational Fluid Dynamics

- Computer and Electronics

- Fundamental Sciences
Grid Infrastructure Development
Thailand National Grid Project

- Thai Grid Group (Dec. 2000~)
- Government approval 2004
- Build Grid computing infrastructure and coordination office
- KU’s HPCNC proposed to Min. of ICT. in 2004
  - Approved with ~ $US 5.5 M in 3 yrs
  - Starting this October
- 3 main components
  - National Grid Committee
  - National Grid Platform
    - One 1 TFlops cluster
    - Sixteen 32-node clusters
  - National Excellence Center for Grid Computing
- Immediate aim: identify key application areas
NECTEC Current Resources

- 33 Nodes Cluster
  - 1.4 GHz Dual Itanium2
  - Total Memory 128GB
  - Storage 3.2TB
- ROCKS 3.3.0
- HPL Benchmark ~200 GFLOPS
- Lustre 1.2.6 (Operated)
- Gfarm 1.2.9 (now Testing)
Utilization

Bacterial Genome, NECTEC
Carbon Flux Balance, KMITNB
CFD, NECTEC
Tsunami Simulation, CU
Nano-structure, NECTEC
Pyridinyl Peptide Nucleic Acids, CU
Poly(fluorene/vinylene) Derivatives, KU

1000 CPU-Hours

ISGC Taipei 2006
GT4 Testbed

- Local testbed
  - 3 Sites Testbed Based on GT4
  - Testing functions
    - Submit Jobs through WSRF standard
    - Scheduler test: SGE, PBS
    - MPICH-G2
    - Gfarm file system
  - Starting to join with Thailand National Grid testbed on 21 Mar 2006
  - Planing to join with PRAGMA GT4 testbed
APGRID PMA

- Member start on Nov. 2005
- Experimental Level
  - Web based
- Current Status
  - Writing CP/CPS
  - Procurement Equipment
- Production Level in June 2006
Access Grid

- Plan to build full room node
- For international seminars and conferences
- Call for collaborations:
  - Electronics and computing technologies
  - Material science, biotechnology and nanotechnology
- Contact: sornthep@nectec.or.th
AccessGrid

- Equipment
  - Venue Server
  - Bridge Server
  - Full-room Client node

- Functional
  - Domestic Conference Broadcasting
  - ANSCSE-10, NAC-2006
Information Grid Initiative
I want "rain" information to use for my specific application.
Information Grid

- Virtualization of information sources
- Decoupling application and information sources and formats
- Enable user access to any information, anywhere, over heterogeneous environment
Information Grid Architecture
Information Grid Architecture
FY2006 Goals

- Information Grid Infrastructure prototype
  - Demonstrate concept and idea
  - 3 pilot databases + 5 components
    - Information Broker
    - Information Source
    - Discovery Services
    - Marker Directory Services (Web Services part)
    - Information Grid Web Client
- Marker Description Language 1.0 (Draft)
Current Status
Test Bed
Implementation
Conclusion

- Thailand National Grid Project and NECTEC develop Grid Infrastructure
- Current focus on CSE
- Information Grid Initiative

Thank you!