

HPC Advisory Council China Workshop 2010

Welcome!

Workshop Agenda

9:00-9:05	Welcome session by HPC China Committee Dr. Yunquan Zhang , Professor, Vice Chief Director, Libratory of Parallel Computing, ISCAS
9:05-9:10	Welcome session (Gilad Shainer, HPC Advisory Council Chairman)
9:10-9:15	The HPC Advisory Council recent activities (Gilad Shainer, HPC Advisory Council Chairman)
9:15-10:00	Keynote session: Design of collectives and one-sided operations in MPI and their impact on application-level performance and scalability (Professor Dhabaleswar K. Panda, Ohio State University)
10:00-10:20	Opportunities and Challenges of Smart Data Center (Shengzhong Feng, Vice Chief Director, Shenzhen Institutes of Advanced Technology)
10:20-10:30	Coffee break
10:30-11:00	Keynote session: The design and optimization of communication systems in Dawning 6000 (Dr. HUO Zhigang, NCIC)
11:00-11:20	Performance and Scalability of Windows HPC Server 2008 R2 (Wenhao Wu, Microsoft)
11:20-11:50	Cloud computing development at BCC (Dr. Yi Zhang, BCC)
11:50-12:10	The Fermi GPU and HPC Application Breakthroughs (Dr. Peng Wang, Developer Technology Technical Staff, Applications Engineering, and Stan Posey, HPC Applications and Development, NVIDIA)
12:10-12:30	HPC Visualization with EnSight (Aric Meyer, Vision Strategy)
12:30-13:30	Lunch

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Workshop Agenda

13:30-13:50	Heterogeneous HPC Application Performance & Optimization (Kaiyong Zhao, Inspur)
13:50-14:10	Integrated and Optimized Dell HPCC Solution Bundles (Ramesh Rajagopalan, Dell)
14:10-14:30	Using and Managing a Linux Cluster as a Server (Dr. William Lu, Platform Computing)
14:30-15:15	Technical session: Advanced clustering optimizations and applications best practices (Tong Liu, Director of the HPC Advisory Council China Center of Excellence)
15:15-15:30	Coffee break
15:30-15:50	Extraordinary High Performance Storage Solutions for HPC (Philip Zhu, Panasas)
15:50-16:10	The Future Is Heterogeneous Computing (Michael Houston, AMD)
16:10-16:40	Introduction to PARRAY: A Unified Programming Tool for GPU Clusters (Dr. Yifeng Chen, Beijing University)
16:40-17:00	Data center networks: choices and new trends (Prof. Su Jinshu, NUDT)
17:00-17:20	Incremental Migration of C and Fortran Applications to GPGPU using HMPP (Francois Bodin, CAPS)
17:20-17:35	Trends in HPC (BAI Yun Fei, HP)
17:35-18:10	Technical training session (including hands-on): Applications and MPI libraries optimizations at scale (Tong Liu, Director of the HPC Advisory Council China Center of Excellence)
18:10-18:15	Farewell

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HPC Advisory Council Mission

- World-wide HPC organization (160+ members)
- Bridges the gap between HPC usage and its potential
- Provides best practices and a support/development center
- Explores future technologies and future developments
- Explores advanced topics – HPC|Cloud, HPC|Scale, HPC|GPU, HPC|Storage
- Leading edge solutions and technology demonstrations
- For more info: <http://www.hpcadvisorycouncil.com>



HPC Advisory Council Members



Vesta



- Dell™ PowerEdge™ R815 6-node cluster
- Four processors AMD Opteron 6172 (Magny-Cours), 48 Cores per node
- Dual Mellanox ConnectX®-2 40Gb/s InfiniBand adapters per node
- Mellanox 36-Port 40Gb/s InfiniBand Switch
- Memory 128 GB, 1333 MHz memory per node

Apply for System Access

Maia



- Dell™ PowerEdge™ M610 14-node cluster
- Six-Core Intel® Xeon® processor X5670 @ 2.93 GHz
- Mellanox ConnectX®-2 40Gb/s InfiniBand adapters
- Mellanox 36-Port 40Gb/s InfiniBand Switch
- Memory: 24GB memory per node



Apply for System Access

Plutus



- HP Cluster Platform 3000SL
- 16 nodes HP ProLiant SL2x170z scalable servers
- Six-Core Intel® Xeon® processor X5670 @ 2.93 GHz
- Mellanox ConnectX®-2 40Gb/s InfiniBand adapters
- Mellanox 36-Port 40Gb/InfiniBand Switch
- Memory: 24GB memory per node

Apply for System Access



Venus



- SUN Z200 8-node cluster
- Intel Xeon Quad-core X5472 CPUs
- Mellanox InfiniBand ConnectX® 20Gb/s InfiniBand adapter
- Mellanox 20Gb/s InfiniBand Switch
- Memory: 22GB

Apply for System Access

Janus



- Dell™ PowerEdge™ M610 16-node cluster
- Quad-Core Intel® Xeon® processor X5570 @ 2.93 GHz
- Intel Cluster Ready certified cluster
- Mellanox ConnectX® MCQH29-XCC 4X 40Gb/s InfiniBand mezzanine card
- Mellanox M3601Q 36-Port 40Gb/InfiniBand Switch
- Memory: 24GB memory per node



Apply for System Access

Dodecas



- AMD 6000 Series platform, 8-node cluster (24-cores per node)
- AMD Opteron™ Model 6172, 45nm technology
- Mellanox ConnectX®-2 40Gb/s InfiniBand Adapters
- Mellanox M3601Q 36-Port 40Gb/InfiniBand Switch
- Memory: 32GB memory per node

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Saturn



- Dell™ PowerEdge™ M605 12-node cluster
- Quad-Core AMD Opteron™ 2389 ("Shanghai") CPUs
- Mellanox ConnectX® 20Gb/s InfiniBand mezz card
- Mellanox 20Gb/s InfiniBand Switch Module
- Memory: 8GB memory, DDR2 800MHz per node

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Helios



- Mellanox ConnectX® 20Gb/s InfiniBand technology
- 32 Rackable Systems e1000 DC-powered rack-mount servers
- 64 Quad-Core Intel® Xeon® 5500 Series Processors
- Lightweight 30 AWS InfiniBand cables from W.L. Gore & Associates, Inc.
- SkyIO ClusterWare™ HPC cluster management
- 5GB FBW host memory from WitTec Industries

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Osiris



- Dell PowerEdge SC 1435 24-node cluster
- Quad-Core AMD Opteron™ 2382 SE CPUs
- Mellanox InfiniBand ConnectX® HCAs
- Mellanox InfiniBand 36-port switch
- Memory: 16GB memory, DDR2 800MHz per node

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The HPC Advisory Council also supports conferences, vendor content and best practices.

[Conferences](#)

[Best Practices](#)

[Case Studies](#)

[Market Data](#)

[Vendor Content](#)

HPC Advisory Council Technical Content

Conferences

The HPC Advisory Council supports a variety of end-user and OEM-based conferences throughout the year, regularly submits multi-vendor technical presentations for end-user audiences, and provides technical support for demonstrations.

Best Practices

The HPC Advisory Council provides best practices, that through experience and research, have shown to improve clustering and applications productivity. The HPC Advisory Council is encouraging HPC users to provide their feedback and suggest other application or HPC areas as candidates for future best practices.

Case Studies

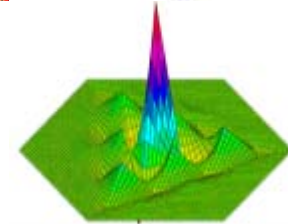
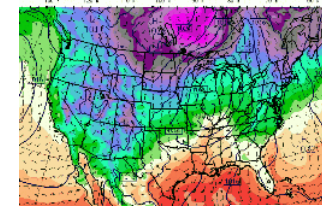
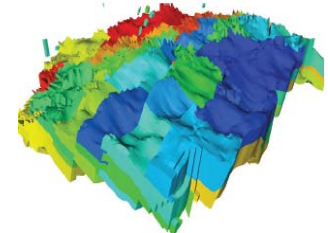
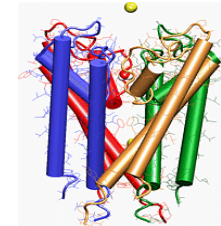
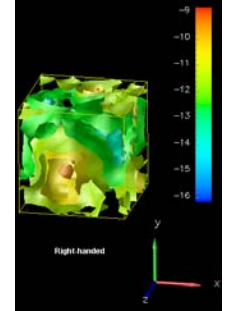
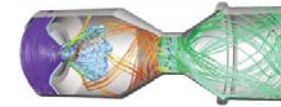
The HPC Advisory Council provides opportunities for its members to collaborate on various HPC initiatives that showcase real-world multi-vendor product demonstrations, education and outreach, and more. The HPC Advisory Council is encouraging members and HPC users to suggest other potential candidates for future case studies.

Market Data

The HPC Advisory Council provides market and revenue data, and results from end-users studies. This information provides a deep insight and perspective around the dynamics of the current and emerging HPC market segments, market trends and influences that effect customer behavior and technology adoption.

Applications Best Practices

- LAMMPS - Large-scale Atomic/Molecular Massively Parallel Simulator
- D. E. Shaw Research Desmond
- NWChem
- MPQC - Massively Parallel Quantum Chemistry Program
- ANSYS FLUENT and CFX
- CD-adapco STAR-CCM+ and STAR-CD
- MM5 - The Fifth-Generation Mesoscale Model
- NAMD
- LSTC LS-DYNA
- Schlumberger ECLIPSE
- CPMD - Car-Parrinello Molecular Dynamics
- WRF - Weather Research and Forecast Model
- Dacapo - total energy program based on density functional theory
- Lattice QCD
- Open Foam
- GAMESS
- HOMME
- CCSM
- PARATEC
- Quantum ESPRESSO
- OpenAtom



Special Interest Subgroups

HPC|Scale Subgroup

This group's mission is to explore usage of commodity HPC as a replacement for multi-million dollar mainframes and proprietary based supercomputers with networks and clusters of microcomputers acting in unison to deliver high-end computing services.

HPC|Cloud Subgroup

This group's mission is to explore usage of HPC components as part of the creation of external/public/internal/private cloud computing environments.

HPC|Works Subgroup

This group's mission is to provide best practices for building balanced and scalable HPC systems, performance tuning and application guidelines.

HPC|Storage Subgroup

This group's mission is to demonstrate how to build high-performance storage solutions and their affect on application performance and productivity. One of the main interests of the HPC|Storage subgroup is to explore Lustre based solutions, and to expose more users to the potential of Lustre over high-speed networks.

HPC|GPU Subgroup

This group's mission is to explore usage models of GPU components as part of next generation compute environments and potential optimizations for GPU based computing.

- **University award program**
 - Universities are encouraged to submit proposals for advanced research around high-performance computing
 - Twice a year, the HPC Advisory Council will select a few proposals
- **Selected proposal will be provided with:**
 - Exclusive computation time on the HPC Advisory Council's Compute Center
 - Invitation to present the research results in one of the HPC Advisory Council's worldwide workshops, including sponsorship of travel expenses (according to the Council Award Program rules)
 - Publication of the research results on the HPC Advisory Council website and related publications
 - Publication of the research results and a demonstration if applicable within HPC Advisory Council world-wide technology demonstration activities
- **Proposals for the 2011 HPC Advisory Council University Award Program can be submitted between August 1, 2010 through October 30, 2010. The selected proposal(s) will be determined by November 15th and the winner(s) will be notified.**

Thank You

www.hpcadvisorycouncil.com

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