HPC Advisory Council

Introduction

The HPC Advisory Council Update

- World-wide HPC non-profit organization (370+ members)
- Bridges the gap between HPC usage and its potential
- Provides best practices and a support/development center
- Explores future technologies and future developments
- Leading edge solutions and technology demonstrations

HPC ADVISORY COUNCIL

HPC Advisory Council Members

Centers of Excellence

Special Interest Subgroups

- **HPC|Scale Subgroup**
  - Explore usage of commodity HPC as a replacement for multi-million dollar mainframes and proprietary based supercomputers
- **HPC|Cloud Subgroup**
  - Explore usage of HPC components as part of the creation of external/public/internal/private cloud computing environments.
- **HPC|Works Subgroup**
  - Provide best practices for building balanced and scalable HPC systems, performance tuning and application guidelines.
- **HPC|Storage Subgroup**
  - Demonstrate how to build high-performance storage solutions and their affect on application performance and productivity
- **HPC|GPU Subgroup**
  - Explore usage models of GPU components as part of next generation compute environments and potential optimizations for GPU based computing
- **HPC|FSI Subgroup**
  - Explore the usage of high-performance computing solutions for low latency trading, productive simulations and overall more efficient financial services
- **HPC|Music**
  - To enable HPC in music production and to develop HPC cluster solutions that further enable the future of music production

HPC Advisory Council HPC Center

Dell™ PowerEdge™ R720xd/R720
33-node cluster

HP ProLiant SL230s Gen8
4-node cluster

HP Cluster Platform 3000SL
16-node cluster

Dell™ PowerEdge™ C6145
6-node cluster

Dell™ PowerEdge™ R815
11-node cluster

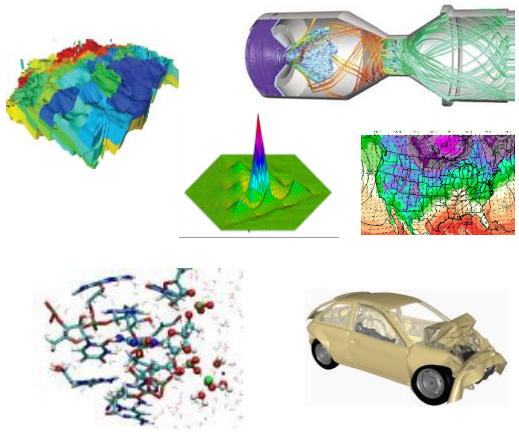
Dell™ PowerVault
MD3220 / MD3260
InfiniBand-based
Lustre Storage

Dell™ PowerEdge™ C6100
4-node cluster

Dell™ PowerEdge™
M610
38-node cluster

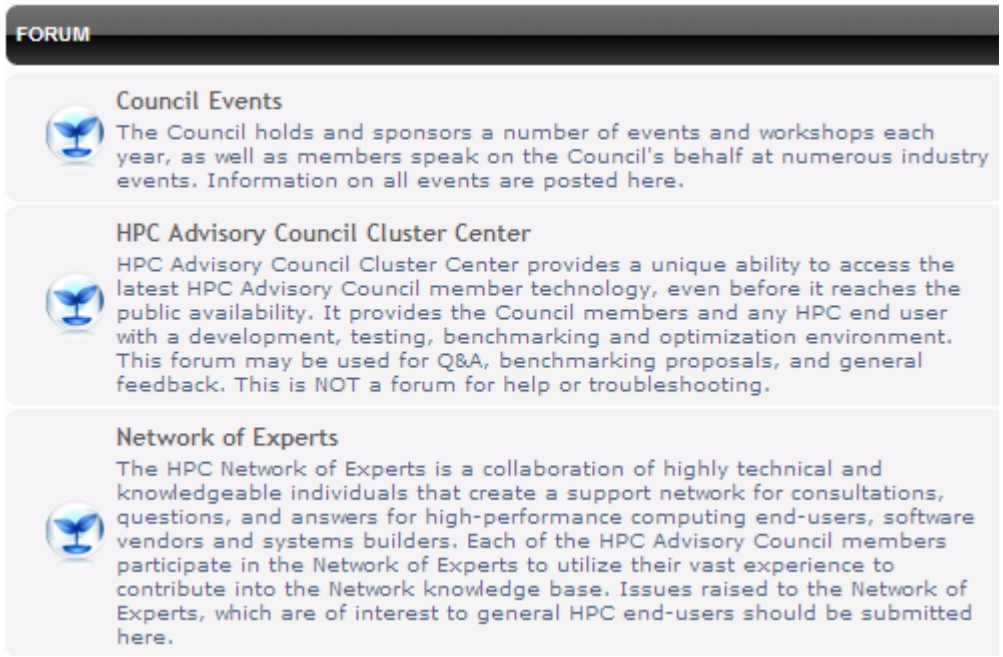
130 Applications Best Practices Published

- Abaqus
- AcuSolve
- Amber
- AMG
- AMR
- ABySS
- ANSYS CFX
- ANSYS FLUENT
- ANSYS Mechanics
- BQCD
- CCSM
- CESM
- COSMO
- CP2K
- CPMD
- Dacapo
- Desmond
- DL-POLY
- Eclipse
- FLOW-3D
- GADGET-2
- GROMACS
- Himeno
- HOOMD-blue
- HYCOM
- ICON
- Lattice QCD
- LAMMPS
- LS-DYNA
- miniFE
- MILC
- MSC Nastran
- MR Bayes
- MM5
- MPQC
- NAMD
- Nekbone
- NEMO
- NWChem
- Octopus
- OpenAtom
- OpenFOAM
- MILC
- OpenMX
- PARATEC
- PFA
- PFLOTRAN
- Quantum ESPRESSO
- RADIOSS
- SPECFEM3D
- WRF



HPC Training

- **HPC Training Center**
  - CPUs
  - GPUs
  - Interconnects
  - Clustering
  - Storage
  - Cables
  - Programming
  - Applications
- **Network of Experts**
  - Ask the experts



University Award Program

- **University award program**
  - Universities are encouraged to submit proposals for advanced research
  - Once / 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 in one of the HPC Advisory Council's worldwide workshops
  - Publication of the research results on the HPC Advisory Council website

- **2010 award winner is Dr. Xiangqian Hu, Duke University**
  - Topic: "Massively Parallel Quantum Mechanical Simulations for Liquid Water"
- **2011 award winner is Dr. Marco Aldinucci, University of Torino**
  - Topic: "Effective Streaming on Multi-core by Way of the FastFlow Framework'
- **2012 award winner is Jacob Nelson, University of Washington**
  - "Runtime Support for Sparse Graph Applications"
- **2013 award winner is Antonis Karalis**
  - Topic: "Music Production using HPC"

- **To submit a proposal – please check the HPC Advisory Council web site**

ISC'14 – Student Cluster Competition

- **University-based teams to compete and demonstrate the incredible capabilities of state-of- the-art HPC systems and applications on the ISC'14 show-floor**

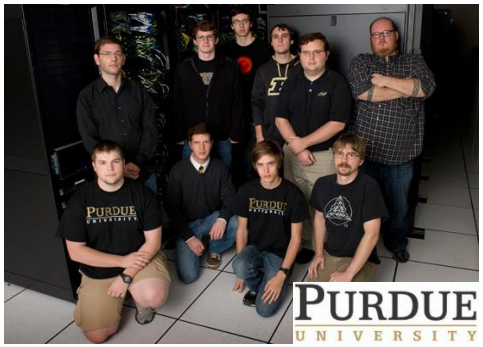
- **The Student Cluster Challenge is designed to introduce the next generation of students to the high performance computing world and community**

INTERNATIONAL SUPERCOMPUTING CONFERENCE

HPC ADVISORY COUNCIL

AIRBUS

ISC'13 – Student Cluster Competition Teams



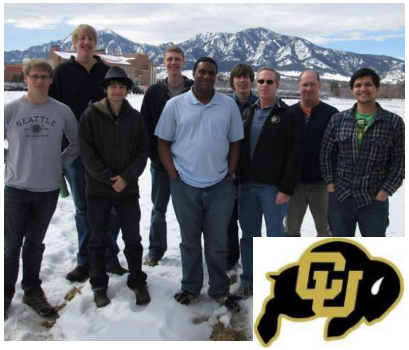
Don Browne Swapnil Gaikwad Nikolaos Koutsikos Paolo Paride Martino

Xu Guo (Coach)

TECHNISCHE UNIVERSITÄT CHEMNITZ

Rene Oertel (Supervisor Daniel Putzky Martin Sommer Martin Winter

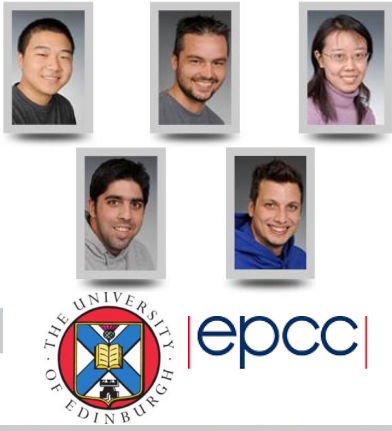
Michael Gothel Ronny Kramer Peter v. Einsiedel Peter Kuffner

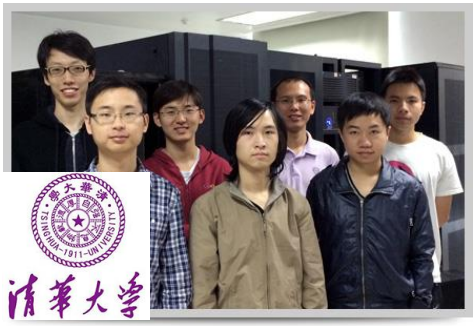


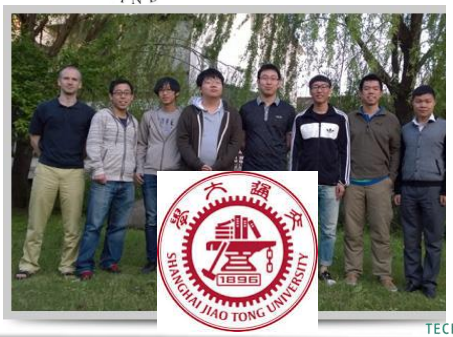
ISC'13 Student Cluster Competition

ISC'14 – Student Cluster Competition Teams

HPC ADVISORY COUNCIL







HPCAC-ISC'14 SCC – University Teams

2013 European HPC Conference (June)

2013 Spain HPC Conference (September)

2013 China HPC Conference (Oct)

2014 Stanford HPC Conference (Feb)

2014 Swiss HPC Conference (April)

2014 HPC Advisory Council Conferences

- **HPC Advisory Council (HPCAC)**
  - 370+ members, http://www.hpcadvisorycouncil.com/
  - Application best practices, case studies
  - Benchmarking center with remote access for users
  - World-wide workshops
  - Value add for your customers to stay up to date and in tune to HPC market

- **2014 Workshops**
  - USA (Stanford University) – Feb 3, 2014
  - Switzerland (CSCS) – March 31, 2014
  - Brazil – May 26, 2014
  - Germany (ISC'14) – June 22, 2014
  - Spain – Sep 24, 2014
  - China (HPC China) – Nov 2014
  - South Africa – Dec 2014
- **For more information**
  - www.hpcadvisorycouncil.com
  - info@hpcadvisorycouncil.com

Contact Us

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