



HPC Advisory Council

Introduction

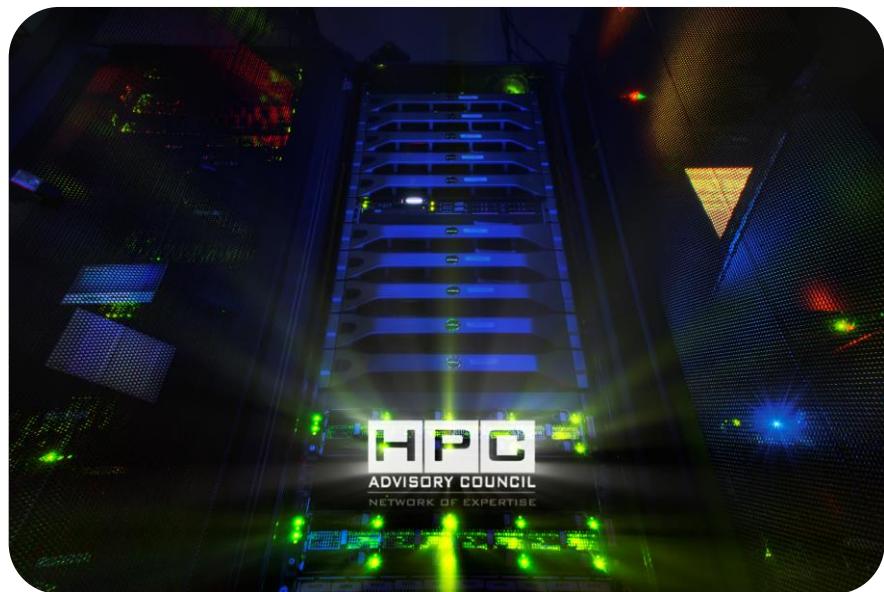
The HPC Advisory Council Update

- 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 Objectives

- HPC Technology
- Network of Expertise
- HPC Outreach
- High-Performance Center
- Education
- Best Practices

A graphic of a human head from the neck up, with a red and orange mesh overlay representing a 3D model or simulation. The HPC Advisory Council logo is positioned in the lower right corner of the slide area.

HPC Advisory Council Members

HPC
ADVISORY COUNCIL



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



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

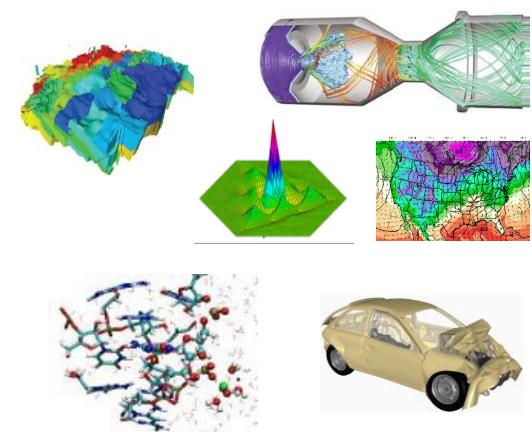


Dell™
PowerEdge™
M610
38-node cluster



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
- PARATEC
- PFA
- PFLOTRAN
- Quantum ESPRESSO
- RADI OSS
- SPECFEM3D
- WRF
- Nekbone
- NEMO
- NWChem
- Octopus
- OpenAtom
- OpenFOAM



HPC Training

- **HPC Training Center**
 - CPUs
 - GPUs
 - Interconnects
 - Clustering
 - Storage
 - Cables
 - Programming
 - Applications

FORUM

Council Events



The Council holds and sponsors a number of events and workshops each year, as well as members speak on the Council's behalf at numerous industry events. Information on all events are posted here.

HPC Advisory Council Cluster Center



HPC Advisory Council Cluster Center provides a unique ability to access the latest HPC Advisory Council member technology, even before it reaches the public availability. It provides the Council members and any HPC end user with a development, testing, benchmarking and optimization environment. This forum may be used for Q&A, benchmarking proposals, and general feedback. This is NOT a forum for help or troubleshooting.

Network of Experts



The HPC Network of Experts is a collaboration of highly technical and knowledgeable individuals that create a support network for consultations, questions, and answers for high-performance computing end-users, software vendors and systems builders. Each of the HPC Advisory Council members participate in the Network of Experts to utilize their vast experience to contribute into the Network knowledge base. Issues raised to the Network of Experts, which are of interest to general HPC end-users should be submitted here.

- **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

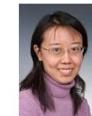


ISC'14 | Student Cluster
Competition

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

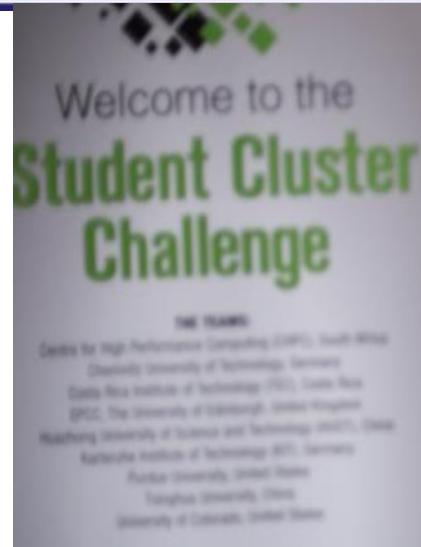


Michael Gotheil Ronny Kramer Peter v. Einsiedel Peter Kuffner



ISC'13 Student Cluster Competition

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ISC'14 – Student Cluster Competition Teams

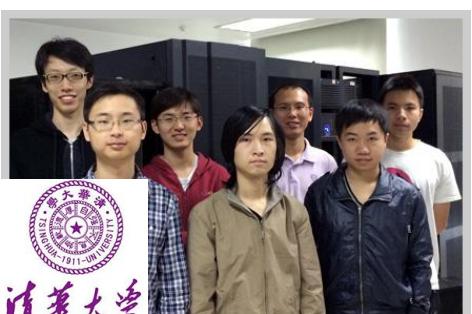
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Northeastern University



THE UNIVERSITY
OF EDINBURGH | epcc



TECHNISCHE UNIVERSITÄT
CHEMNITZ

HPCAC-ISC'14 SCC – University Teams



Northeastern University



BENTLEY
UNIVERSITY



Universität Hamburg
DER FORSCHUNG | DER LEHRE | DER BILDUNG



ISC'14 | Student Cluster
Competition

2013 European HPC Conference (June)



HPC Advisory Council European Conference 2013

June 16, 2013
The Congress Center Leipzig
Leipzig, Germany



2013 Spain HPC Conference (September)



2013 China HPC Conference (Oct)



2014 Stanford HPC Conference (Feb)



HPC Advisory Council Stanford Conference and Exascale Workshop 2014

February 3-5, 2014
Munger Conference Center/Paul Brest Hall
Stanford University



STANFORD
UNIVERSITY



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



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Twitter: www.twitter.com/hpccouncil

YouTube: www.youtube.com/user/hpcadvisorycouncil

