MEGWARE HPC & Cluster Systems

„Made in Saxony“

Jörg Heydemüller – HPC Representative / Sales Director
Company Profile

• established in 1990
• private limited company
• authorised capital: 790,000 €
• 60 fully qualified employees
• more than 400 installed clusters systems all over Europe since the year 2000
Chemnitzer Linux Cluster (CLIC)

- in the year 2000 Prof. Hans-Werner Meuer: "the worldwide best price performance ratio"
- position 126 in Top500
- 528 nodes
- performance 143,3 GFlops
Areas of application worldwide

- in the area of research and universities:
  astronomy, biology, physics, chemistry, earth science, health research, climatology
- in engineering:
  automobile construction, aerospace, defense armament, oil and gas
- other areas - data management:
  financial sector, internet, media
Available system architectures

- x86 HPC cluster and server with Linux or Windows
- hybrid HPC cluster with x86 and Tesla GPU
- parallel storage cluster
x86 HPC cluster Linux / Windows

- access to all possible network technologies
- application of different motherboard manufacturers possible
- large choice of different CPUs
x86 HPC Cluster Linux / Windows

- since 2001 different kinds of high speed networks in use (Myrinet 2000, 10G Ethernet, Infiniband)
- MEGWARE is producer neutral as related to Infiniband - for example:
x86 HPC Linux cluster

• application of different system software standards
• Open Suse, Suse Linux Enterprise, Redhat, CentOs, Scientific Linux, …
x86 HPC Windows cluster

- specialist for configuration, design, administration for Windows HPC Server 2008

- MEGWARE - Microsoft Certified Technology Specialist

- MEGWARE – under the Top 5 Win HPC 2008 resellers in Germany
x86 HPC with Nvidia Tesla GPU

- Tesla increases the parallel performance of clusters
- with the GPU processors it is no more about graphic arts, but about an increase of the performance of the whole system
- the users can perform bigger calculations
Parallel Storage Cluster

- distributed file systems based on Lustre, FHGFS
- high performance scratch-data files with Lustre
- infiniband storage solution with OCFS2 for special requirements
MEGWARE developments

- SlashFive®
- SlashEight®
- ClustRack®
- ClustStor®
- ClustSafe®
- ClustWare®
- RackView®
MEGWARE SlashFive®

- service friendly server chassis
- 16 nodes on 8 rack units in one main chassis
- up to 160 Dual or Quad Core CPUs
- compatible with Intel® or AMD® CPU
- intelligent air flow
MEGWARE SlashEight®

- service friendly server chassis
- 32 nodes on 8 rack units in one main chassis
- up to 320 Dual or Quad Core CPUs
- compatible with Intel® or AMD® CPU
- intelligent air flow
MEGWARE ClustRack®

- demountable aluminium case
- in 14 variant sizes
- compatible with 19 inch, SlashFive® and SlashEight®
- front and back door up to 70% perforated
- inlying, intelligent cable route
Experience with water-cooled racks since 2003

- systems based on Knürr®, Schäfer® and Rittal®
- almost independent of room temperature
- cooling capacity up to 35 kW per rack
MEGWARE ClustSafe®

- intelligent power distribution unit for power management
- for up to 18 devices
- on device control panel, display and remote access
- selectable start delay
- connection of different sensors
- up to 1,000 watt per power outlet
MEGWARE ClustWare®-Appliance

- cluster management software
- management - server - cluster - software
- control of the complete cluster as related to work load
- filing, statistics MP per node, DRC per ClustRack®
- MP read sensors, steers power on/off, reset and serial bracket
MEGWARE RackView®

- comfortable control of cluster nodes
- easy operation of power supply unit
- display of power consumption and input
- comprehensive status indications (monitoring)
- energy-efficient management functions
- cost-effective adaptation of energy consumption
MEGWARE ClustCool

- in development
- direct watercooling with up to 35 degrees warm water
- copper pipelines connected with all important chips
MEGWARE ClustCool

- two instead of six cooling fans
- four saved cooling fans in 16 nodes (32 servers) = 128 fans
- 128 fans multiplied with 12 watts = 1,536 watts = 1.5 kW/h
- 1.5 kW/h multiplied with 24 hours = 36 kW/h per day
- 1,080 kW/h per month
- 12,960 kW/h per year
MEGWARE ClustCool

- 12,960 kW/h per year
- 38,880 kW/h for three years multiplied with 0.15 € per kW/h
  = 5,832.00 € for 16 nodes (32 servers)
- 52,588.00 € for 128 nodes (256 servers) in three years
Beginning of a partnership

• benchmark center
• remote or directly in Chemnitz
• remote access to one server node or to a whole cluster
• … or we do the tests for you!
• support by our own HPC Engineers
• access to partner resources (Intel, AMD)
Long-term partnership

- project manager for customer support
- adapted, individual service level with different periods of warranty
- pick up & return with various response time
- qualified service hotline
- compensation hardware near to cluster
The purpose is a well-balanced HPC system

- perfect integration in data center infrastructure
- application performance runs to 100%
- initial cost and TCO
- optimum in service by MEGWARE
400 installed systems in Europe

- France
- Abu Dhabi
- Greece
- Poland
- Czech
- Cyprus
- Switzerland ...
Leibniz Rechenzentrum Munich

• supercomputer for participation in the international ATLAS experiment at CERN
• delivery and installation of four HPC cluster systems
• number of processor cores: 1,964
• interconnect: 10 G Ethernet
• storage system: 110 TB
MPI für Eisenforschung Düsseldorf

• Max-Planck-Institut für Eisenforschung GmbH (Germany) supercomputer for the development of simulation tools for the prediction of material properties

• position 355 in the Top500 – June 2009

• number of nodes: 235

• number of processor cores: 1,880 Intel Xeon® E5472

• interconnect: infiniband DDR
MEGWARE partnerships
Thank you for your attention.

www.megware.com
joerg.heydemueller@megware.com