CRAY
THE SUPERCOMPUTER COMPANY

Einweihung der Cray XT6
16. Juli 2010

UNIVERSITÄT
DUISBURG
ESSEN

Dr. Ulla Thiel
VP Cray Europe

Cray Kunden in Europa

CRAY THE SUPERCOMPUTER COMPANY

CSCS Swiss National Supercomputing Centre

212 TF

AEMet Agencia Estatal de Meteorología

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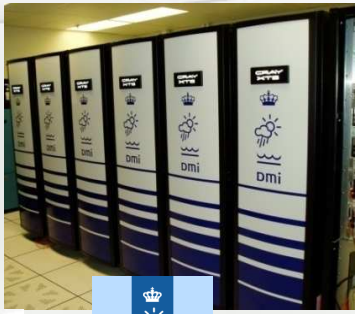
31 TF



DMI

35 TF

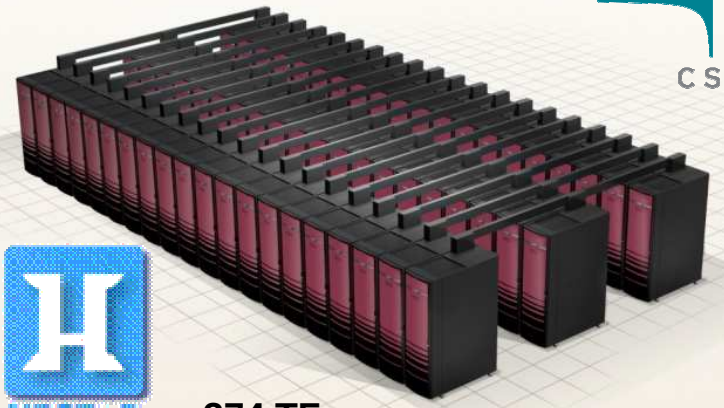
35 TF

EADS

HLRS

93 TF

KTH VETENSKAP OCH KONST



HECToR

374 TF

CSC

100 TF

50 TF

Cray Today

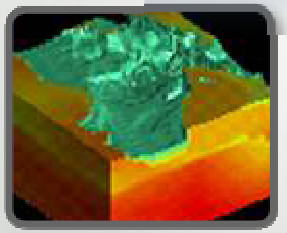
- **Nasdaq: CRAY**
  - Formed on April 1, 2000 as Cray Inc.
  - Headquartered in Seattle, WA
  - Roughly 850 employees across 30 countries
- **Four Major Development Sites:**
  - Austin, TX
  - Chippewa Falls, WI
  - Mendota Heights, MN
  - Seattle, WA
- **Significant Progress**
  - DOE Leadership Class system at Oak Ridge National Lab at over 1 PF
  - NERSC system over 350TF
  - Sandia Red Storm went from 40 TF to 280TF
  - CSCS and HECToR systems over 200TF within 2009
  - $250M DARPA HPCS Phase III award for Cascade program
  - NSF funded PF system at University of Tennessee
  - Four production weather forecasting sites in Europe using Cray technology: CSCS for Meteo Swiss, DMI (Denmark), FMI (Finland) and AEMet (Spain)

Cray = Supercomputing

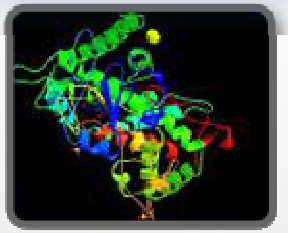
We build the world's largest and fastest supercomputers for the highest end of the HPC market

For government agencies, research institutions and large enterprises

We help solve the "Grand Challenges" in science and engineering that require supercomputing



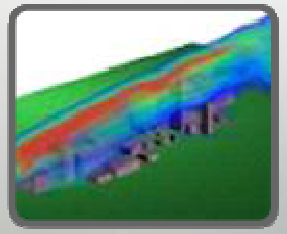
Earth Sciences



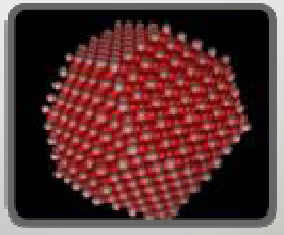
Life Sciences

Aerospace Research

Automotive Engineering



National Security and Defense



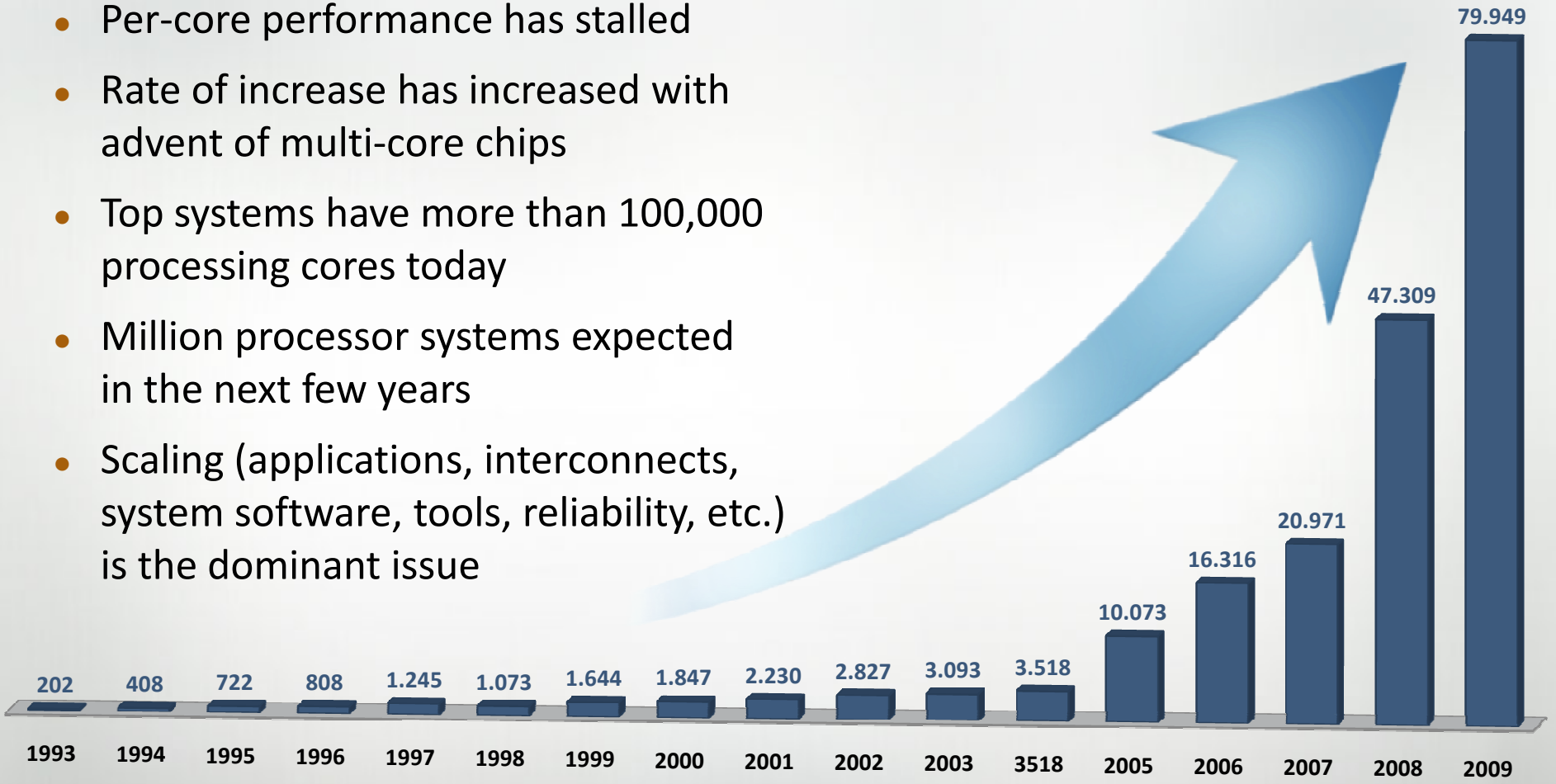
Scientific Research

Main areas of Research & Development in Cray

System Interconnect	Custom interconnect and communications network
Systems Management & Performance	Software to productively manage and extract performance out of thousands of processors as a single system
Packaging & Power Efficiency	Very high density, upgradeability, liquid and air-cooling

Increasing Importance of Scaling

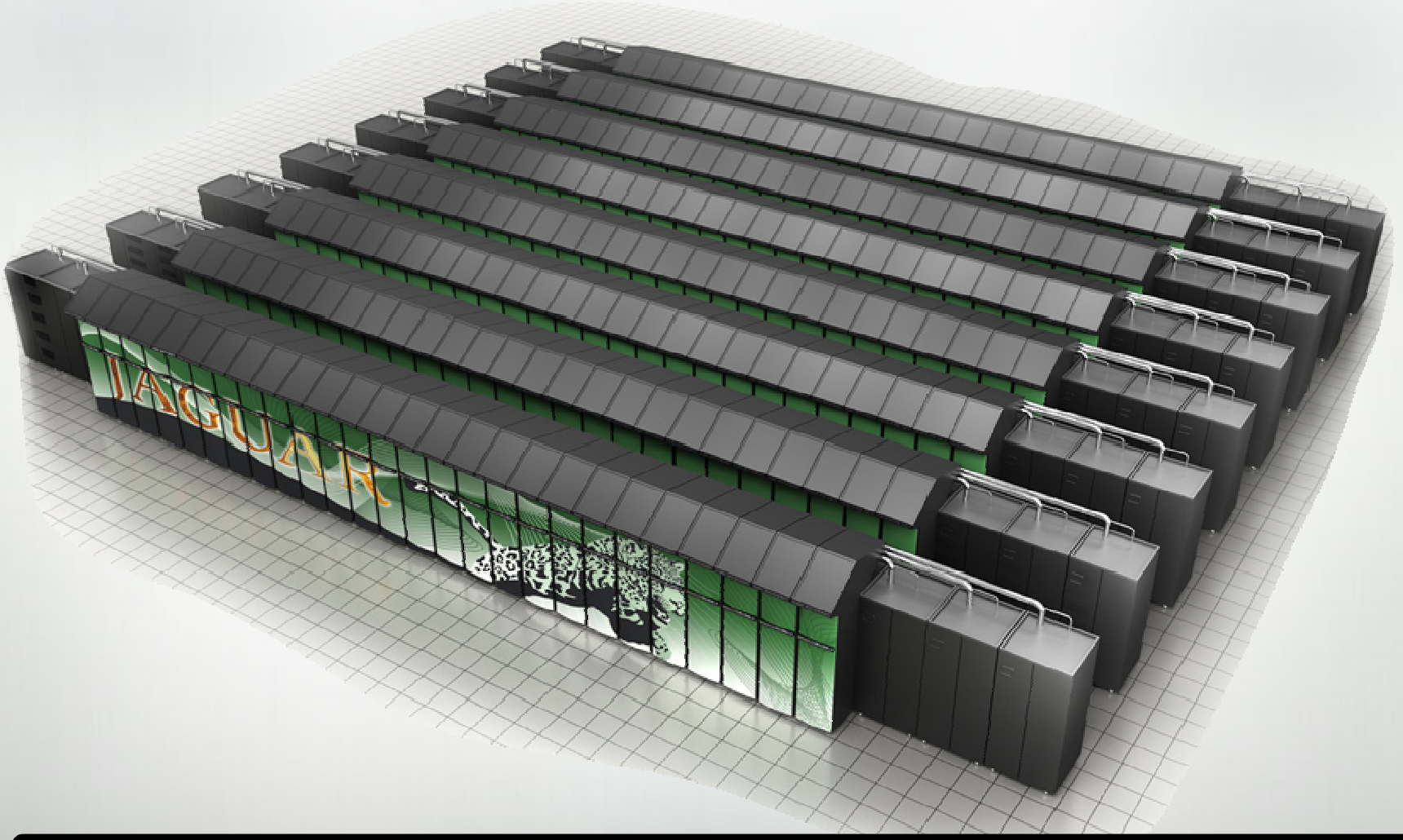
- Per-core performance has stalled
- Rate of increase has increased with advent of multi-core chips
- Top systems have more than 100,000 processing cores today
- Million processor systems expected in the next few years
- Scaling (applications, interconnects, system software, tools, reliability, etc.) is the dominant issue



Average Number of Processor Cores per Supercomputer (Top 20 of Top500)

Source: www.top500.org

“Jaguar”
Oak Ridge National Labs XT5 Petaflops System



Example of Cray’s strong customer partnership focus → from 3 TF to 1PF and beyond

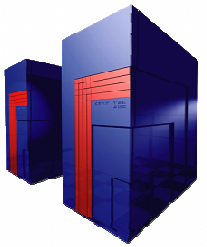
A History of Breaking Sustained Performance Barriers …Looking at the Gordon Bell Prize

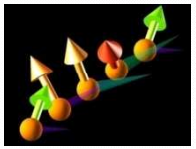
1 GF 1988; Cray Y-MP; 8 Processors

- Static finite element analysis

1 TF; 1998; Cray T3E; 1,024 Processors

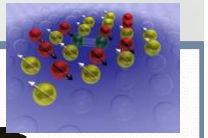
- Modelling of metallic magnet atoms

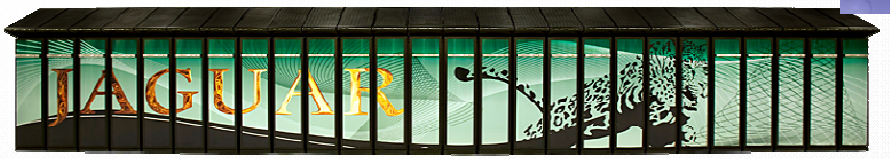




1 PF; 2008; Cray XT5; 150,000 Processors

- Superconductive materials





1 EF; ~2018; ? ; 10,000,000 Processors

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Dankeschön!