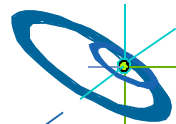# SPEC Benchmarks at HLRS

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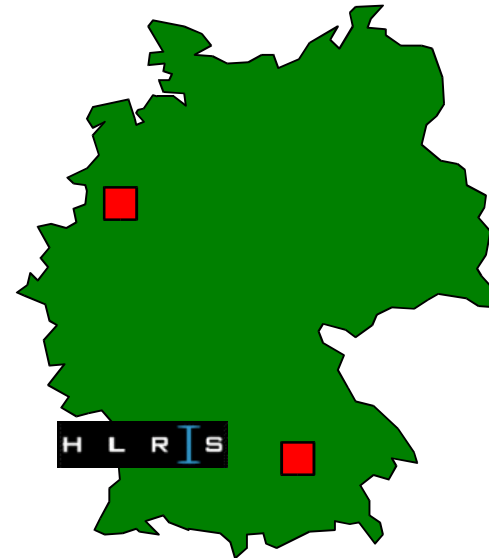
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The role of HLRS in Germany

- 3 National High Performance Computing Centers
  - HLRS at Stuttgart (1996)
  - NIC at Jülich (1997)
  - LRZ at Munich (1999)
- **Provide Supercomputing Performance to the German research community**
- Coordinated procurements
  - Provide different kinds of architectures
  - Provide state of the art technology
    - **1996: NEC SX-4 (HLRS)**
    - **1997: Cray T3E (HLRS and NIC)**
    - **1999: NEC SX-5 (HLRS)**
    - **2000: Hitachi SR8000 (Munich)**
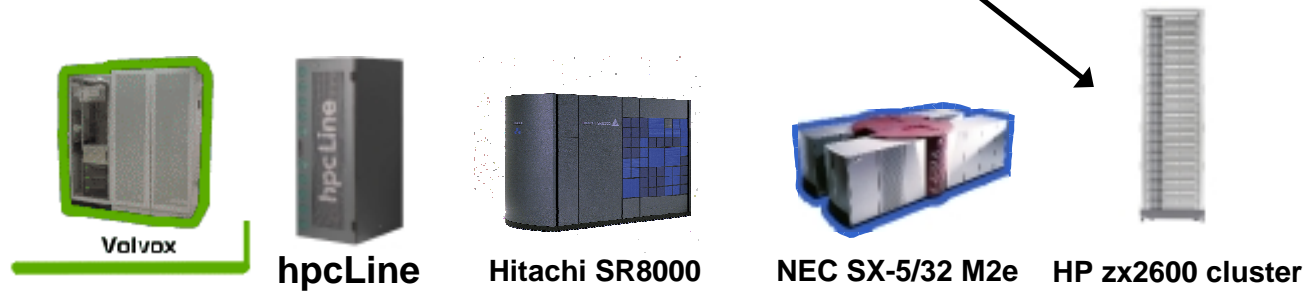   - **2002: IBM (NIC)**
    - **2003: ??? (HLRS)**

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Target Platforms at HLRS

SMP:

hp N-Class   SGI Origin 2000   NEC Azusa   Cray SV1/20   NEC SX-4/32 H2

MPP:

Cray T3E-900/512

Intel Tiger

**Cluster
of SMP:**

Volvox   **hpcLine**   Hitachi SR8000   NEC SX-5/32 M2e   HP zx2600 cluster

Intel Itanium 2 evaluation at HLRS
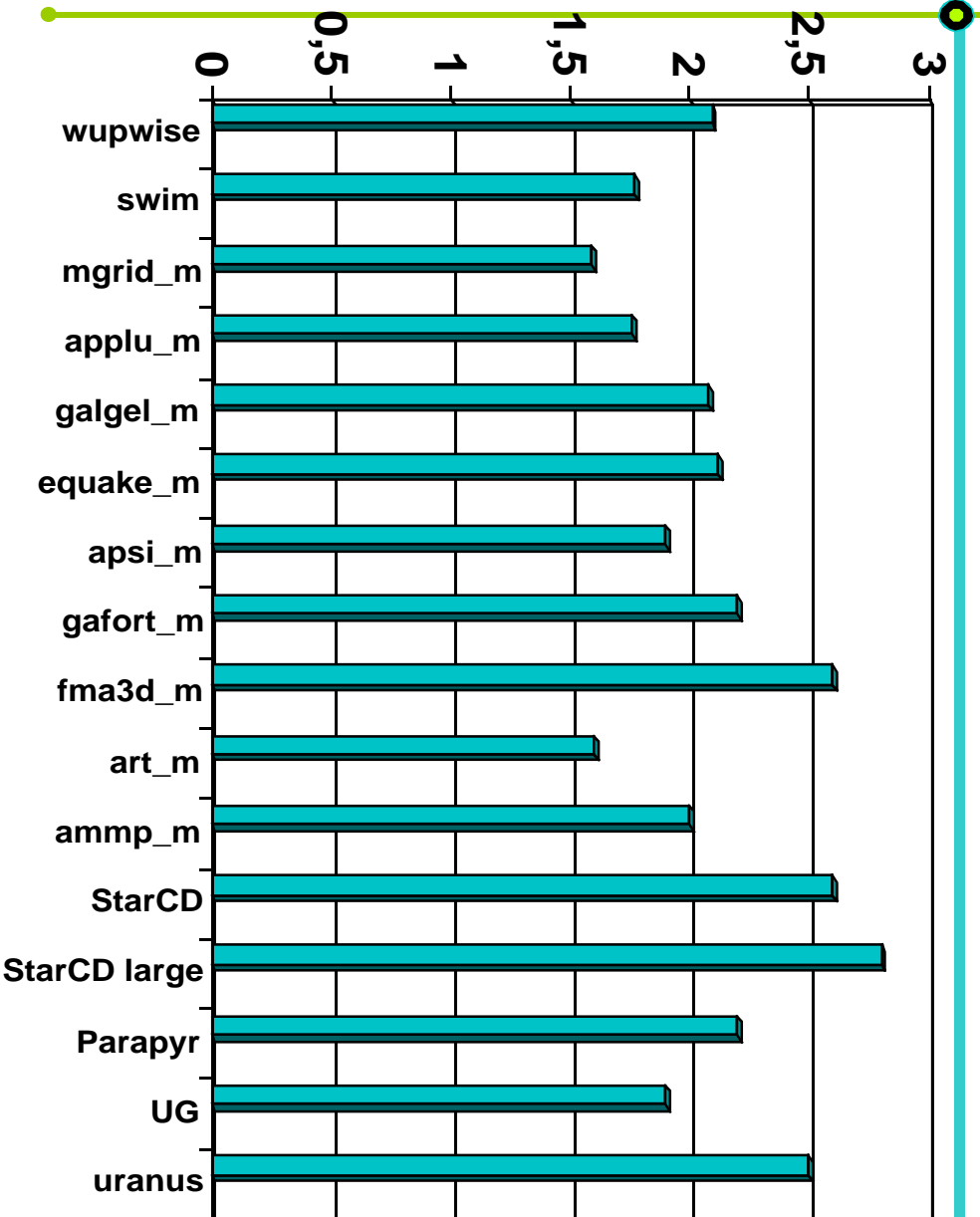
- General steps in evaluation of new systems:
    - Portability issues (compiler, libraries)
    - Correctness
    - Stability
    - Performance
- SPEC OMP benchmarks offer a convenient framework for all the issues above
- Performance of own applications is more important, but:
    - SPEC benchmarks can represent the non-power users
    - You can look at the single application results and choose the numbers that are the most relevant
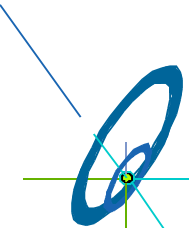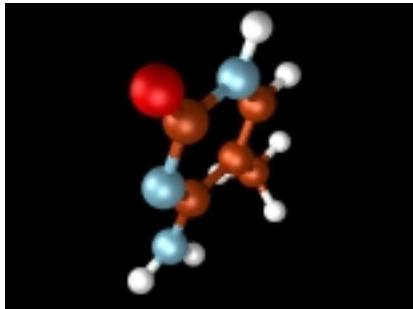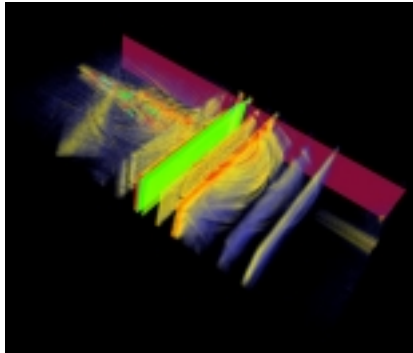
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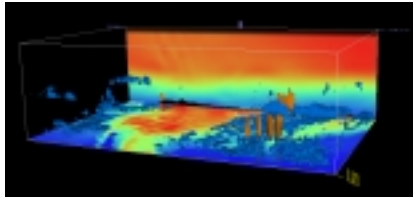Höchstleistungsrechenzentrum Stuttgart

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SMP Performance Gain Itanium/Itanium 2

benchmark	value
wupwise	2.1
swim	1.8
mgrid_m	1.65
applu_m	1.8
galgel_m	2.1
equake_m	2.1
apsi_m	1.9
gafort_m	2.2
fma3d_m	2.6
art_m	1.6
ammp_m	2.0
StarCD	2.6
StarCD large	2.85
Parapyr	2.2
UG	1.9
uranus	2.5

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SPEC HPC2002 effort

- Full Application benchmarks (including I/O) targeted at HPC platforms
- OpenMP and/or MPI
- Currently three applications:
  - SPECenv: weather forecast
  - SPECseis: seismic processing
  - SPECchem: comp. chemistry
- HLRS efforts:
  - increasing portability
  - Candidate codes for new benchmarks

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