Access to the Federal High-Performance Computing-Centers

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TOP 500 — Nov. 2002 List — German Sites, 1st part

federal
thematic
regional

Rank	Installation Site	Location	R_{max} Gflop/s	Peak Gflop/s	Manufacturer Computer / Procs	Year of Installation
21	Max-Planck-Gesellschaft MPI/IPP	**Garching**	**2010** =51%	3910	IBM pSeries 690 Turbo 1.3GHz/ **752**	2002
27	Leibniz Rechenzentrum	**München**	**1653** =82%	2016	Hitachi SR8000-F1/168/ **168**	2000 / 2002
31	Deutscher Wetterdienst	**Offenbach**	**1293** =67%	1920	IBM SP Power3 375MHz 16way/ **1280**	2001
44	HLRN at Universitaet Hannover / RRZN	**Hannover**	**1038** =52%	1996	IBM pSeries 690 Turbo 1.3GHz/ **384**	2002
45	HLRN at ZIB/Konrad Zuse-Zentrum fuer Informationstechnik	**Berlin**	**1038** =52%	1996	IBM pSeries 690 Turbo 1.3GHz/ **384**	2002
49	DKRZ - Deutsches Klimarechenzentrum	**Hamburg**	**982** =96%	1024	NEC SX-6/128M16/ **128**	2002
64	Universitaet Heidelberg - IWR	**Heidelberg**	**825** =58%	1430	Megware HELICS AMD1.4GHz Myrinet/ **512**	2002
84	Deutscher Wetterdienst	**Offenbach**	**671** =69%	974	Cray Inc. T3E1200/ **812**	1999
135	Forschungszentrum Juelich	**Jülich**	**447** =69%	648	Cray Inc. T3E1200/ **540**	1999
173	Universitaet Aachen/RWTH	**Aachen**	**357** =69%	518	Sun Fire 15K/ **288**	2002

TOP 500 — Nov. 2002 List — German Sites, 2nd part

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Rank	Installation Site	Location	R_{max} Gflop/s	Peak Gflop/s	Manufacturer Computer / **Procs**	Year of Installation
176	Max-Planck-Gesellschaft MPI/IPP	Garching	**355** =73%	487	Cray Inc. T3E/ **812**	1997
181	HWW/Universitaet Stuttgart	**Stuttgart**	**341** =70%	486	Cray Inc. T3E900/ **540**	1996
183	ZIB/Konrad Zuse-Zentrum fuer Informationstechnik	**Berlin**	**341** =70%	486	Cray Inc. T3E900/ **540**	1999
302	Theoretical Chemistry, Ruhr-University Bochum	**Bochum**	**235.8** =66%	358.4	Megware AMD Athlon MP1600+ - SCI 2D-Torus/ **128**	2002
313	Universitaet Darmstadt	**Darmstadt**	**234.0** =47%	499.2	IBM pSeries 690 Turbo 1.3GHz GigEth/ **96**	2002
315	Forschungszentrum Juelich	**Jülich**	**234** =72%	324	Cray Inc. T3E600/ **540**	1996
333	GWDG	**Göttingen**	**226** =67%	336	IBM SP Power3 375 MHz/ **224**	2001
339	Technische Universitaet Chemnitz	**Chemnitz**	**221.6** =52%	424.0	Self-made CLIC PIII 800 MHz/ **530**	2000
373	GWDG	**Göttingen**	**198** =45%	442.4	IBM pSeries 690 1.1GHz GigEth/ **96**	2002
454	Universitaet Aachen/RWTH	**Aachen**	**197.3**	259.2	Sun Fire 15K/ **144**	2002
455	Universitaet Aachen/RWTH	**Aachen**	**197.3**	259.2	Sun Fire 15K/ **144**	2002

High Performance Computing in Germany

Federal

- HLRS/HWW Stuttgart – www.hlrs.de
- NIC Jülich – www.kfa-juelich.de/nic
- LRZ/HLRB Munich – www.lrz-muenchen.de

Thematic (federal)

- RZ Garching – www.rzg.mpg.de
- DKRZ/HLRE Hamburg – www.dkrz.de
- DWD Offenbach – www.dwd.de/de/Technik/Datenverarbeitung/

Regional

- ZIB Berlin – www.zib.de
- RRZN Hannover – www.rrzn.uni-hannover.de

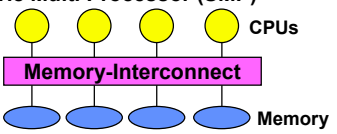
See also

www.hlrs.de/hpc/centers.html and www.top500.org

Architectures

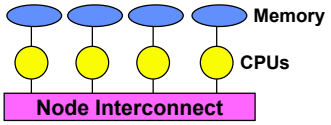
Parallel Vector Processor (PVP) & Symmetric Multi Processor (SMP)

- NEC SX-6, SX-5
- Cray SV1, X1



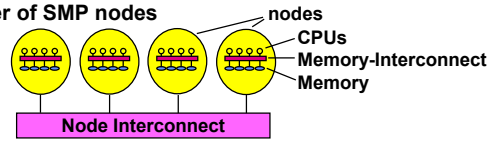
MPP, massively parallel processor achieve

- Cray T3E-1200, 900, 600
- Linux cluster



Hierarchical: Cluster of SMP nodes

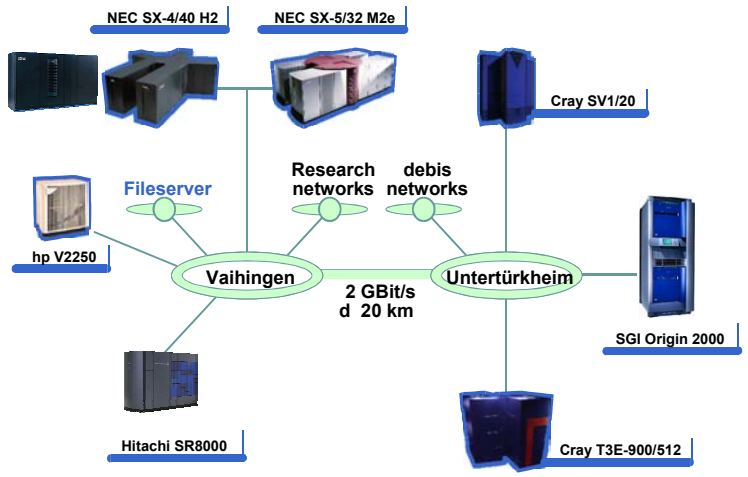
- Hitachi SR8000
- IBM SP
- NEC SX cluster
- Linux cluster



Vector Processing

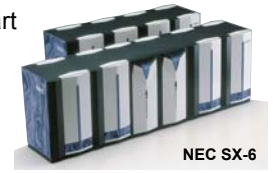
- some platforms perform vector processing
  - vector processor
  - mainly a question of
    - memory bandwidth
      - how many load/stores per floating point operation?
    - memory-interconnect
  - for which memory access pattern
    - the compiler supports the vector access
    - the hardware supports the vector access

HLRS Stuttgart: hww configuration (2003)

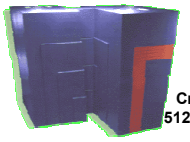


HLRS at Stuttgart

- High-Performance Computing-Center Stuttgart
  Höchstleistungsrechenzentrum Stuttgart (HLRS)
  at University of Stuttgart
- Platforms:
  - NEC SX-5/32 (128 GFlop/s peak)
  - NEC SX-6/48 (550 GFlop/s peak)
    vector system, available ~ April 2004
  - Next generation NEC SX? (~ 12 TFlop/s peak)
    vector system, available ~ early 2005
  - Cray T3E 900-512 – will be substituted by:
  - IA32 and IA64 clusters
- Online-Proposals:
  - **www.hlrs.de**
    —> HW&Access —> Access
    —> proposal
    —> test account (***Schnupperaccount***)


NEC SX-6

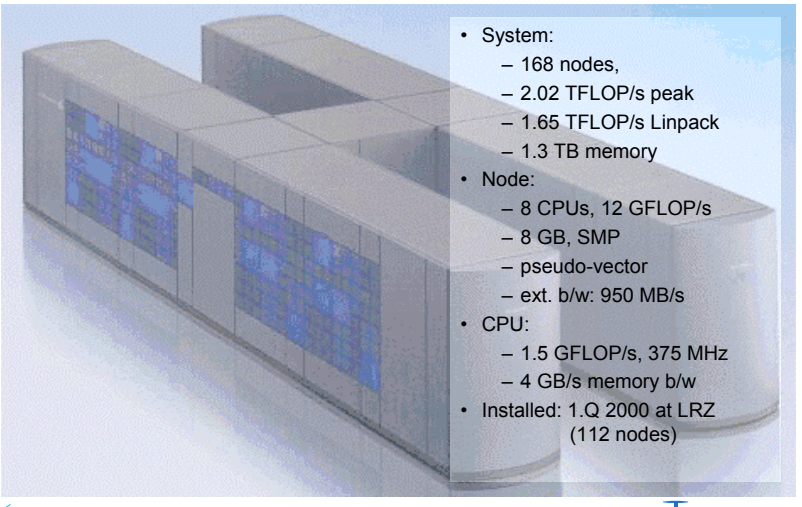
NEC SX-5/32 M2e
2*16 PEs, 128 Gflop/s
80 GByte


Cray T3E 900-512
512 PEs, 461 Gflop/s
64 GByte

NIC at Jülich

- John von Neumann-Institut für Computing (NIC) at Forschungszentrum Jülich
- Platforms:
  - IBM Regatta (30x32 CPUs Power4+ 1.7 GHz, 128 GB/node, Federation Switch with 4 adapters per 32-CPU-SMP node, since Feb 11, 2004)
  - Extension to 41 nodes: March 2004, 8.9 Tflop/s
  - Cray T3E 1200-512 (will be switched off in Summer 2004)
  - Cray SV1ex
- Online-Proposals:
  - www.fz-juelich.de/nic/nic-e.html —> Computing Time
- Deadlines
  - April 30, for accounts valid July – June (next year)
  - Oct. 31, for accounts valid Jan. – Dec. (next year)

LRZ / HLRB at Munich: Hitachi SR8000



- System:
  - 168 nodes,
  - 2.02 TFLOP/s peak
  - 1.65 TFLOP/s Linpack
  - 1.3 TB memory
- Node:
  - 8 CPUs, 12 GFLOP/s
  - 8 GB, SMP
  - pseudo-vector
  - ext. b/w: 950 MB/s
- CPU:
  - 1.5 GFLOP/s, 375 MHz
  - 4 GB/s memory b/w
- Installed: 1.Q 2000 at LRZ (112 nodes)

Hitachi SR 8000-F1/112 (Rank 5 in TOP 500 / June 2000)

- Höchstleistungsrechner in Bayern (HLRB)
  at Leibniz-Rechenzentrum (LRZ)
- Platform:
  - Hitachi SR8000-F1 (168 nodes, each with 8 processors)
- Online-Proposals:
  - www.lrz.de/services/compute/hlrb/
    —> Online Project Proposal Submission

High Performance Computing in Germany — Summary

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- NIC Jülich
- LRZ/HLRB Munich

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- DKRZ Hamburg
- DWD Offenbach

Regional
- ZIB Berlin
- RRZN Hannover

H L R S www.hlrs.de
–>HW&Access–>Access

NIC www.fz-juelich.de/
nic/nic-e.html

www.lrz.de/services/
compute/hlrb/

See also
www.hlrs.de/hpc/centers.html