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THUNDERHEAD

Hardware/Software: Current & Future Vision

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NASA Goddard Space Flight Center

2004 Thunderhead Workshop

November 22, 2004

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OUTLINE

- **Hardware**
- **Software**
- **Applications**
  - geodynamics, gravity waves, solar physics, binary star systems, , computational optics, spacecraft/rover control
- **Future**
  - heterogeneous, grid, adaptive, autonomous

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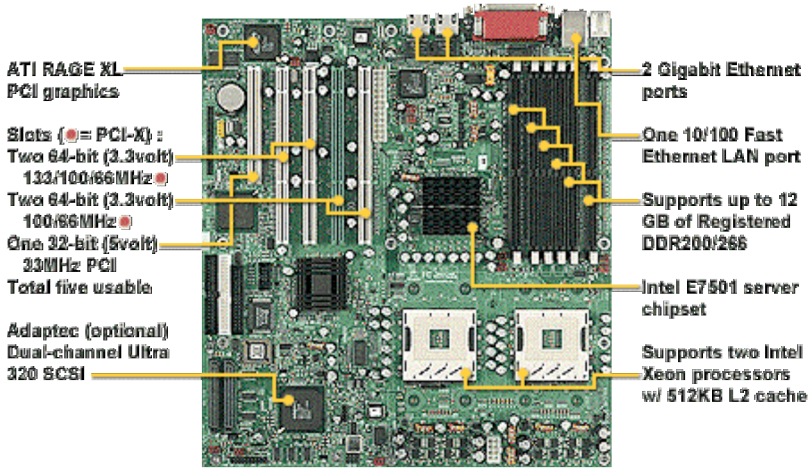
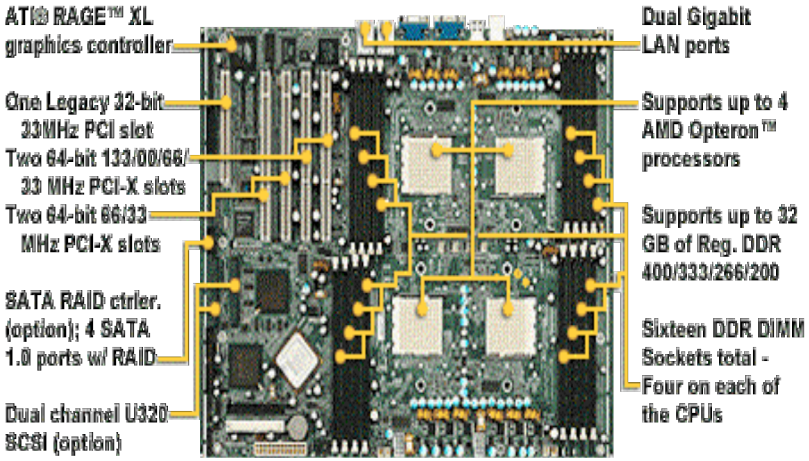
HARDWARE

Aggregate Specification	
Number of nodes	268
Total processors	536
Total memory (Gb)	536
Total diskspace (Tbyte))	21.44
Network interconnect 1	Myrinet 2000
Network interconnect 2	Gigabit Ethernet
Network interconnect 3	Fast Ethernet
Theor peak performance (Tflops)	2.5728
Linpack benchmark (Tflops)	1.2
Node Specification	
Motherboard	Tyan Thunder 2720
Number of processors	2X Intel 4 Xeon 2.4Ghz
Memory (Gb)	1024
Local disk (Gb)	80
Network interconnect 1	Myrinet 2000
Network interconnect 3	Fast Ethernet
Network interconnect 2	Gigabit Ethernet
Peak performance (Gflops)	9.6





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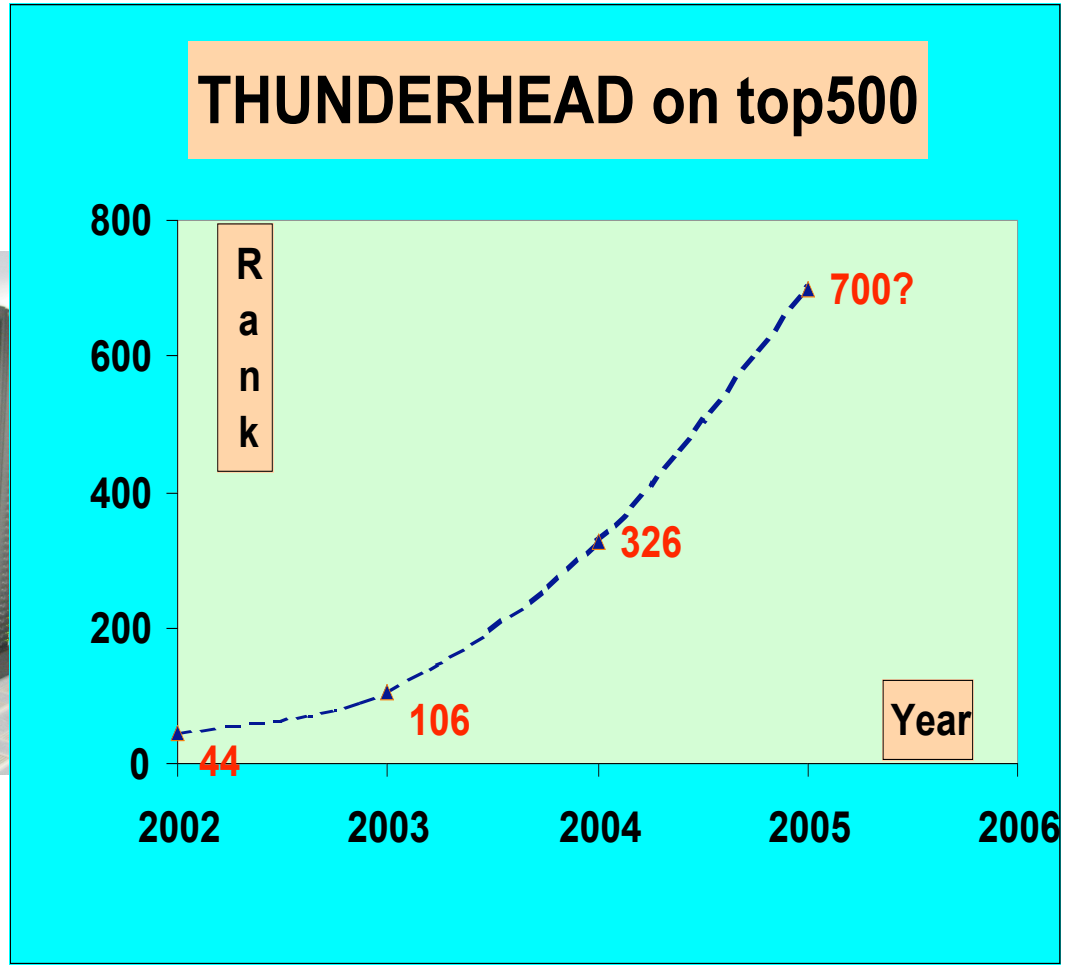
HARDWARE



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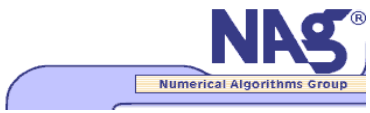
SOFTWARE

- **OS:** Linux Fedora core
- **Network:** GM for Myrinet, Quadrix
- **Compilers (5):** NAG, Lahey, Intel, PGI, GNU (MPI-IO + switcher)
- **Parallel:** Mpich-gm
- **Applications:** Paramesh, Flash, JAT, GSL, GT
- **Scheduler:** LTM , PBS, SGEE
- **Parallel FS:** PVFS1, PVFS2, Lustre
- **Cluster tools**: LACE, Lookie(cpu, mem, cache, load, jobs)



The Portland Group
Compiler Technology