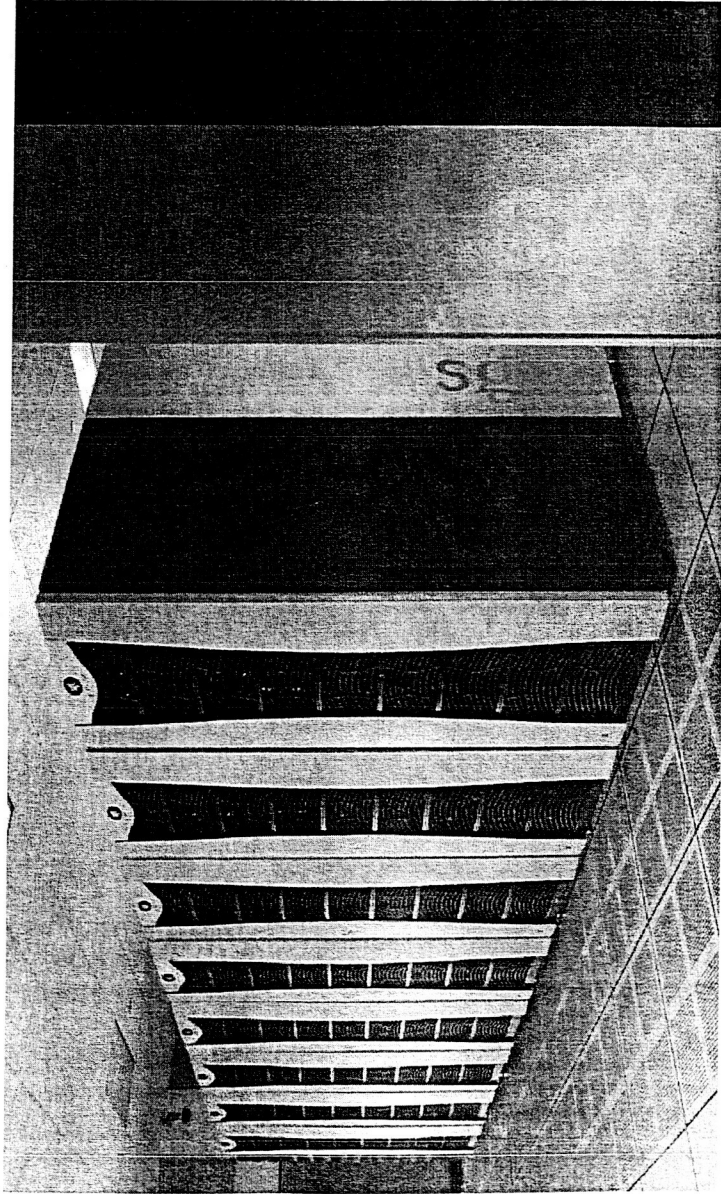


Worlds First SSI 512 Altix

Booted October 30th 2003

NASA Ames and SGI Team

Altix 512 - The Fastest Cache Coherent SSI HPC System in the World



CPUs

512 (Intel Itanium 2 - 1.5 GHz)
6.0 GFLOP/s per CPU
3 TFLOPS total
6 MB cache per CPU
3 GB total Cache

Memory

1 TB total
Cache Coherent
Globally addressable
Shared

Disk

20 TB FC Raid disks

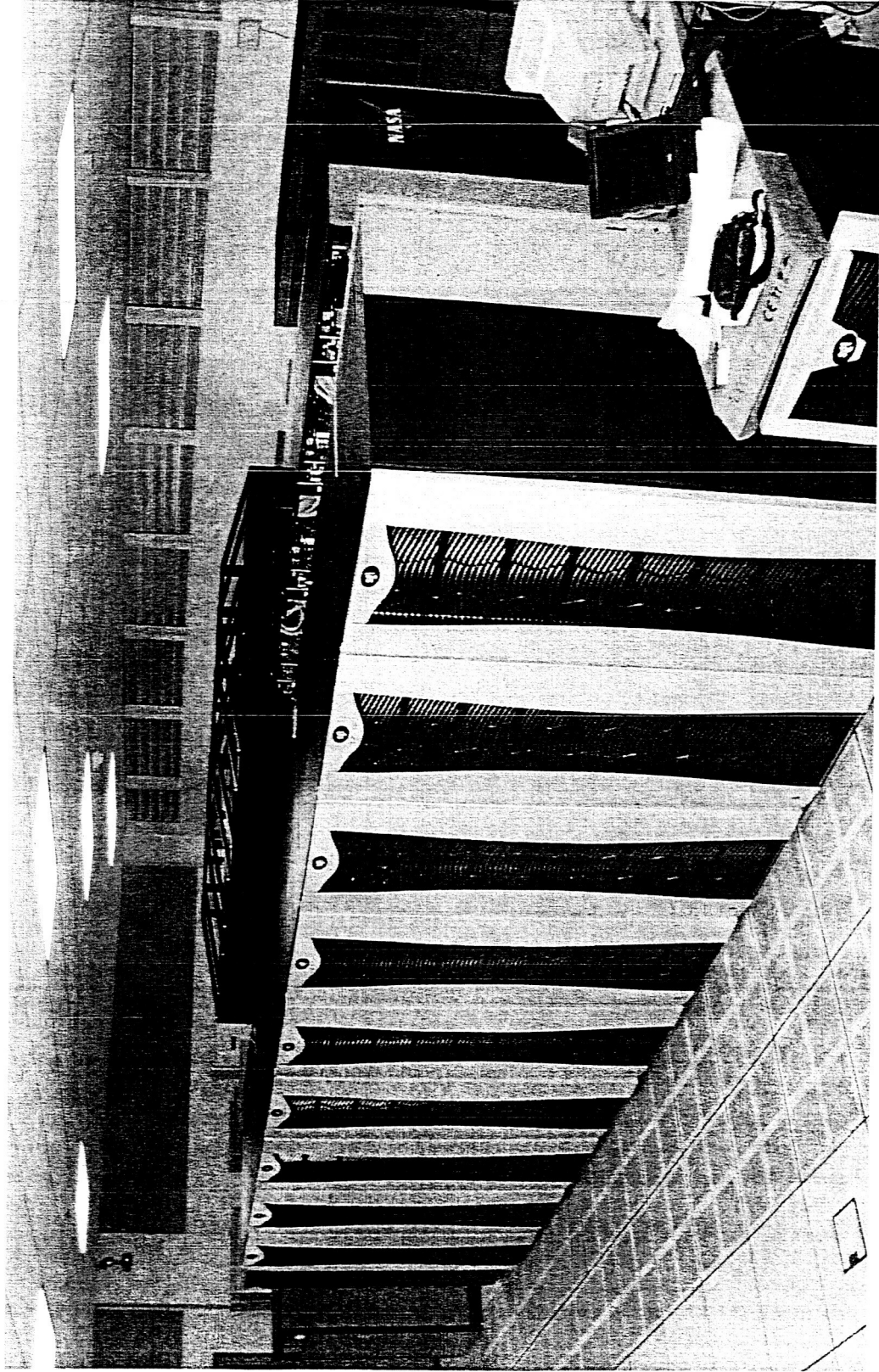
System Software

Linux OS - Single System Image
Single XFS File System
OpenMP support to 512 CPUs





512 Build



Benchmarks

- LINPAC Rmax – 2.45 TeraFLOPS
 - Ranked ~ 17th according to latest Top500 list
 - Not listed – result generated November 13th

- Streams

- Triad 1.007838 TERABYTES/SECOND

- #1 World Ranking

Triad	Add	Scale	Copy
1007828.0053	1008593.7370	854438.0171	854061.5533



CART3D OpenMP/MPI Scaling

(results for 4.6 and 6.4 million cell shuttle configuration)

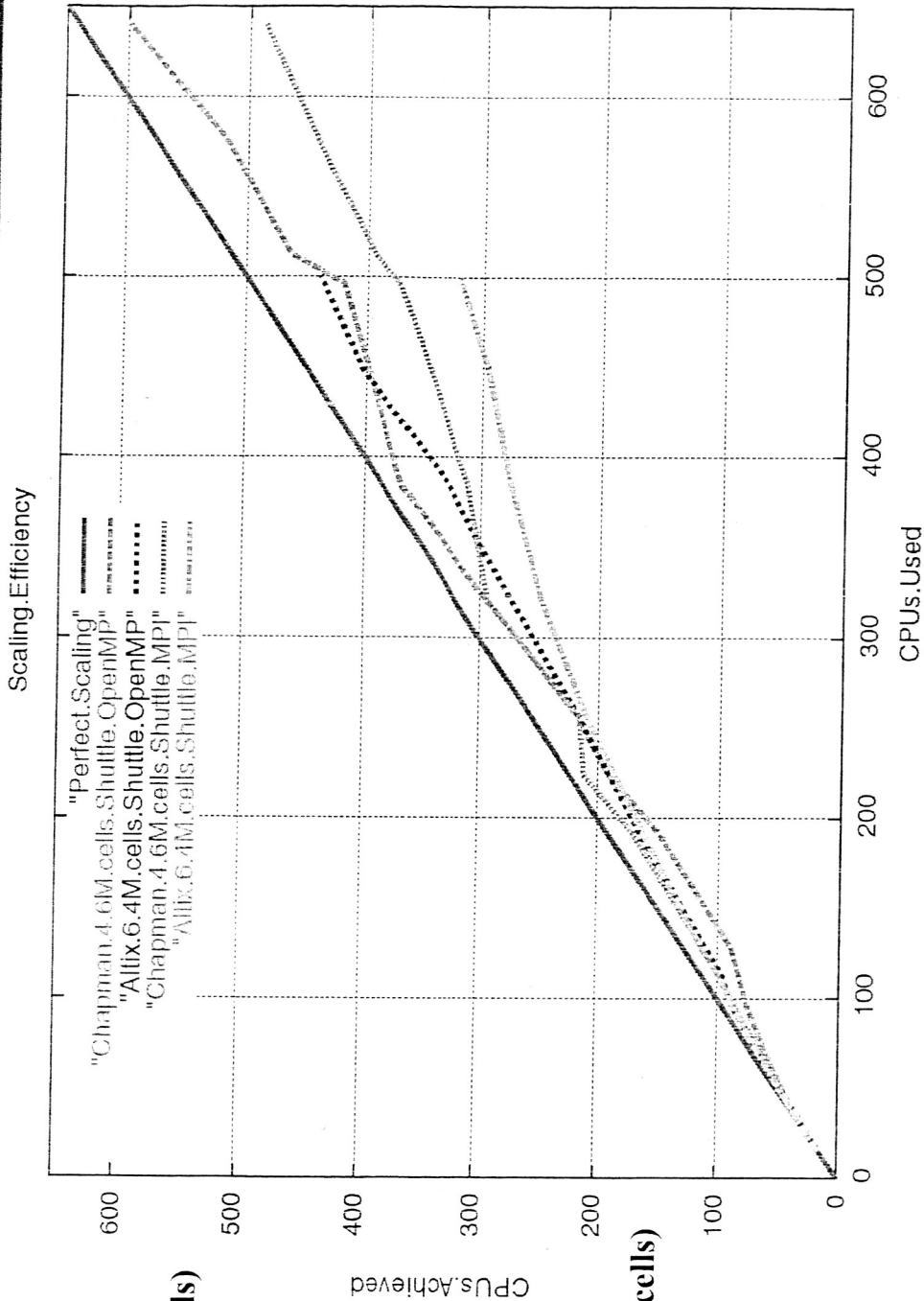
Scaling Efficiency

Altix-512p SSI (6.4 million cells)

	NCPUS	Efficiency
OpenMP	500	88 %
MPI	500	64 %

Origin-1024p SSI (4.6 million cells)

	NCPUS	Efficiency
OpenMP	640	94 %
MPI	640	76 %



OpenMP shows best scaling efficiency of 88% on 500 CPUs for Altix System.

Source: mike.aftosmis@nas.nasa.gov



Shared Memory Systems as NASA Ames

- NASA/SGI Partnership started 1996
 - Would research Single System Image feasibility beyond 64 processors.
 - Resulted in several first of a kind systems at Ames
 - First 256p Origin2000
 - First 512p Origin2000
 - First 512p Origin3000
 - First 1024p Origin3000
 - First 512p Altix

