

Silicon Graphics, Inc.

SGI in the Environmental Sciences

Presented by:

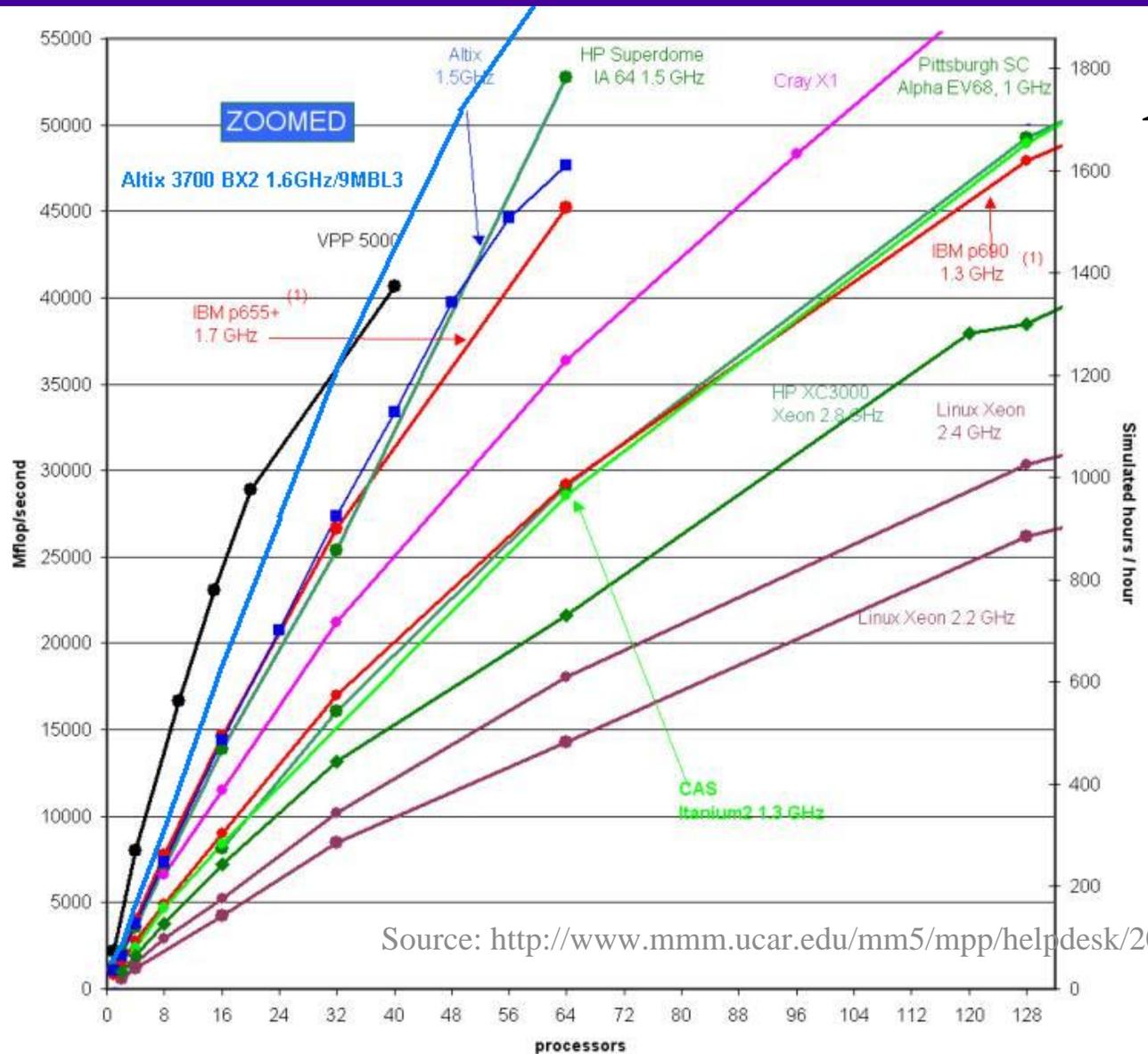
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The legal Page...

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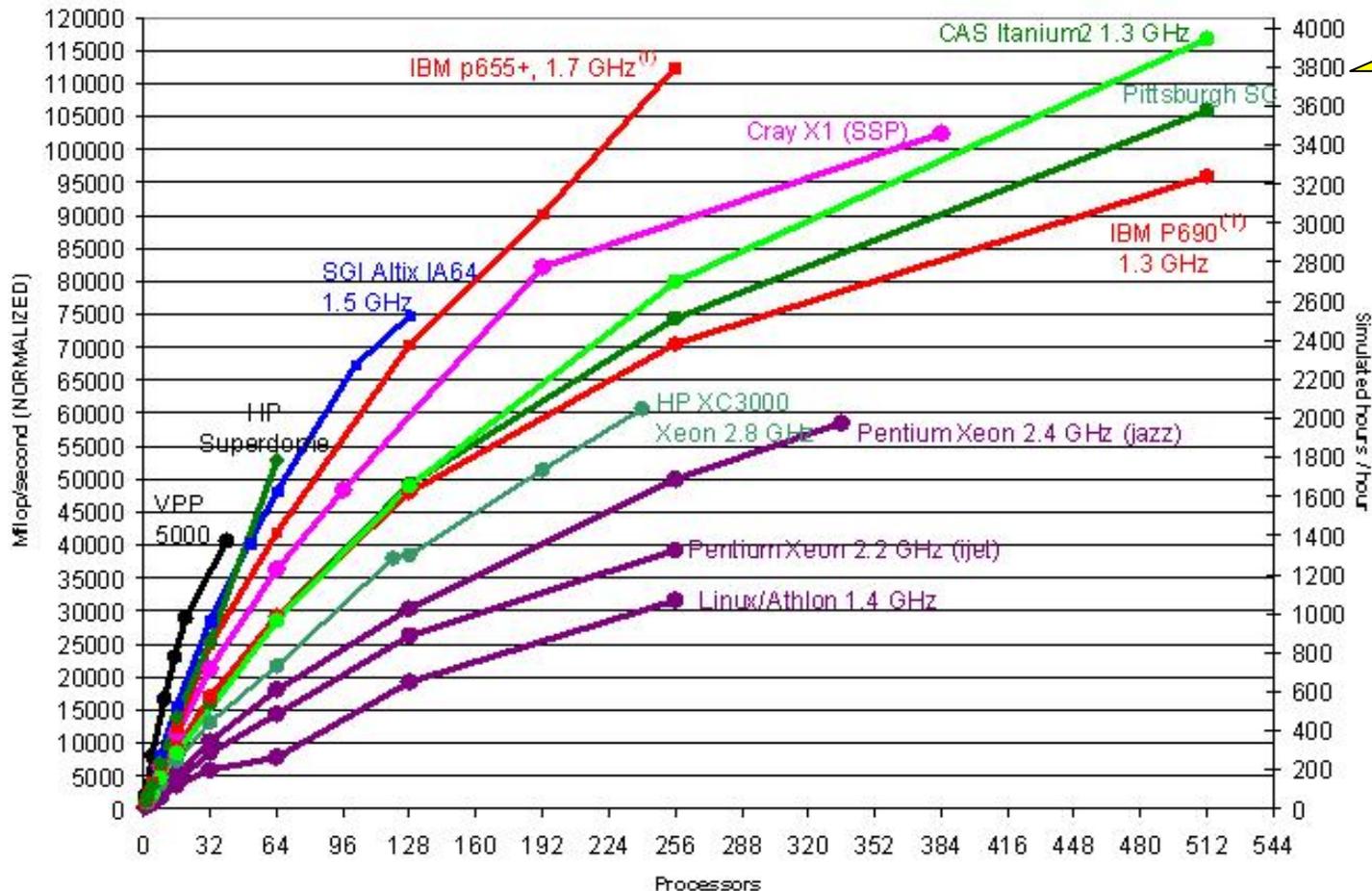
MM5 3.6.3 - Standard benchmark, 2004



Higher is Better

Source: <http://www.mmm.ucar.edu/mm5/mpp/helpdesk/20040304a.html>

MM5 3.6.3 t3a benchmark



Higher is Better

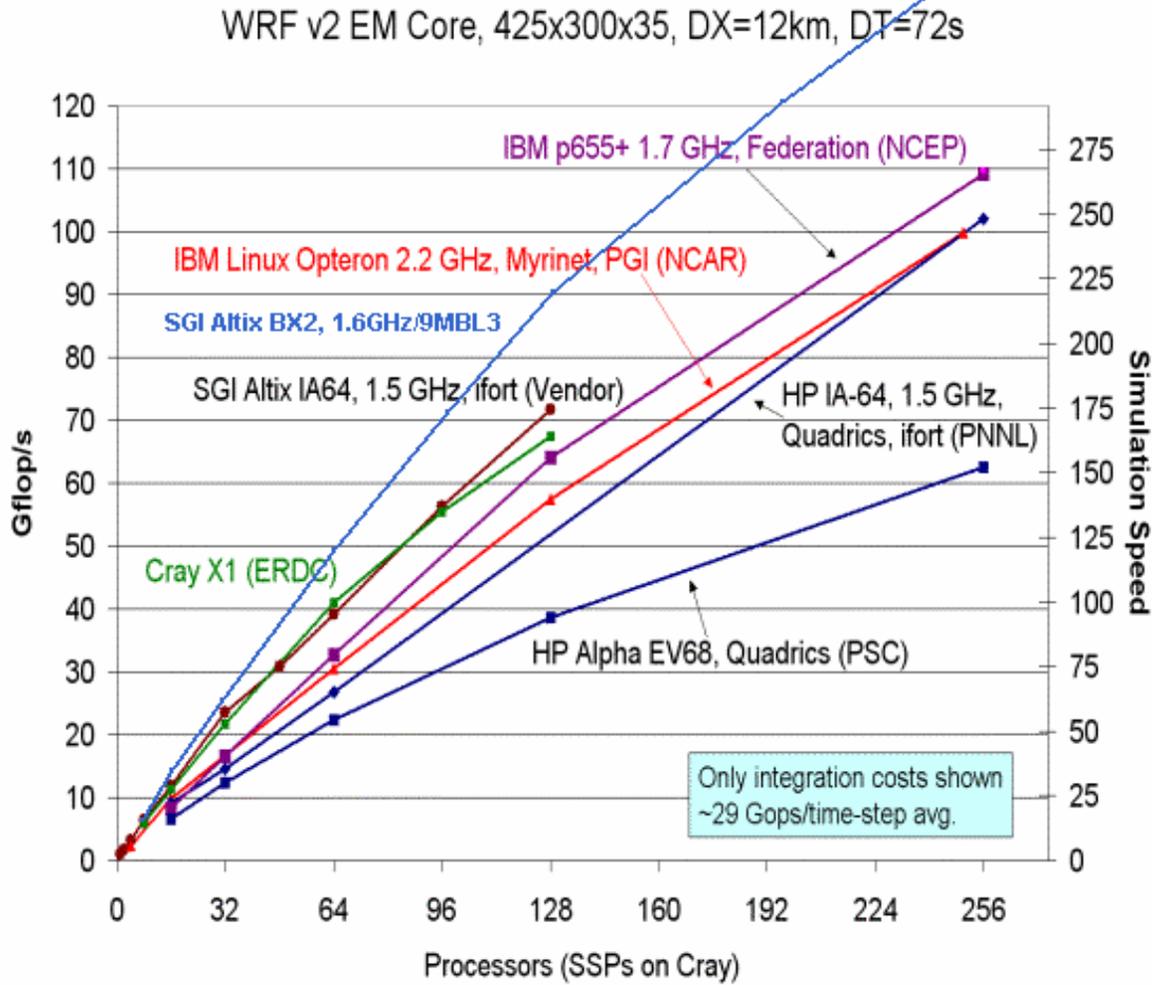
Altix version was compiled with the Intel 8.1.007 (beta) ifort Fortran compiler and the Intel 8.1.010 (beta) icc C compiler, and linked with SGI's MPI from MPT 1.10.

WRF performance

- Version 2, EM core
- 425x300x35 grid, standard benchmark problem
- Data from latest web page shows SGI Altix has fastest performance
- Code scales well to 1024p on standard size benchmark!

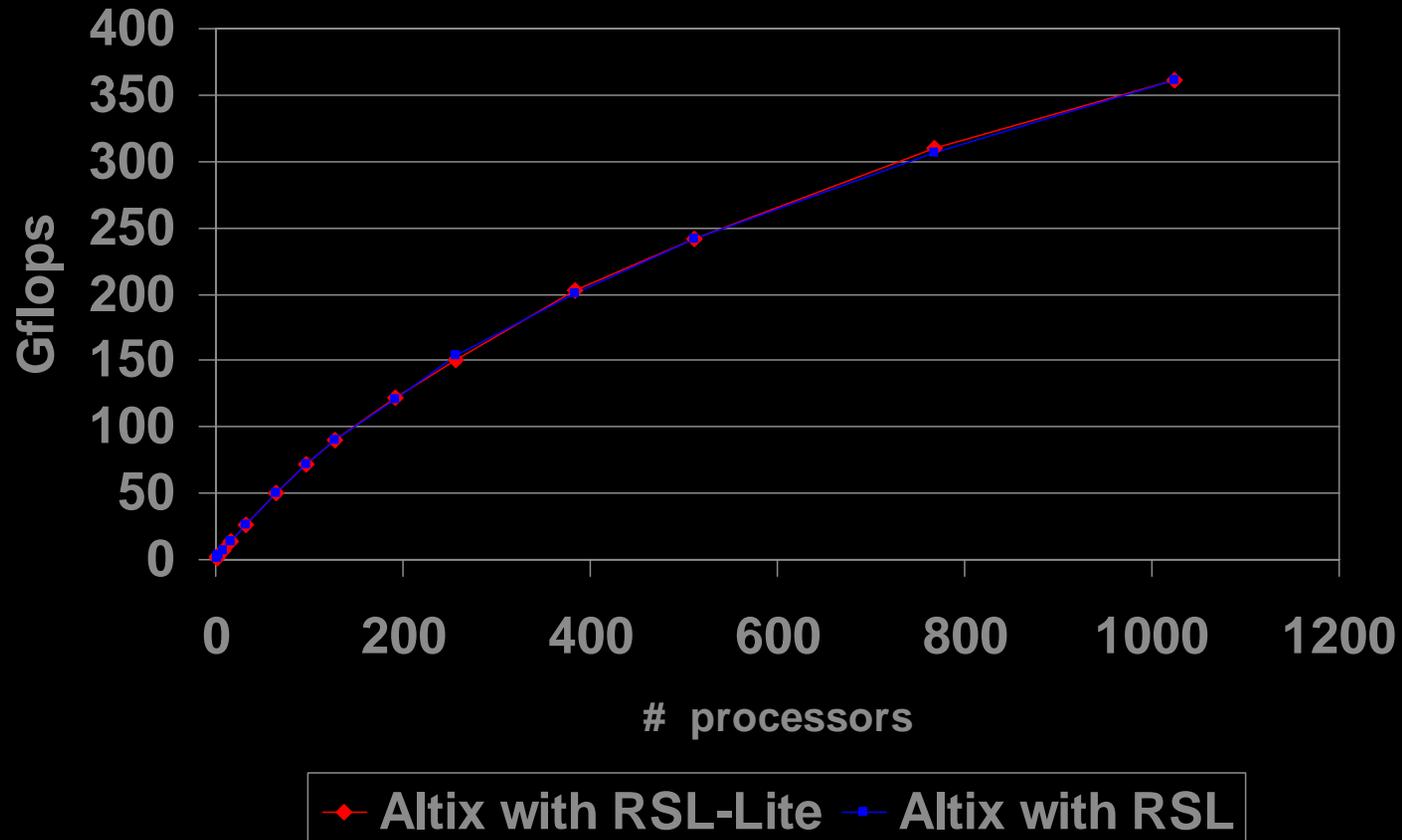
WRF 2.0.2 - Scalability & Performance on Altix 3000

<http://www.mmm.ucar.edu/wrf/bench>

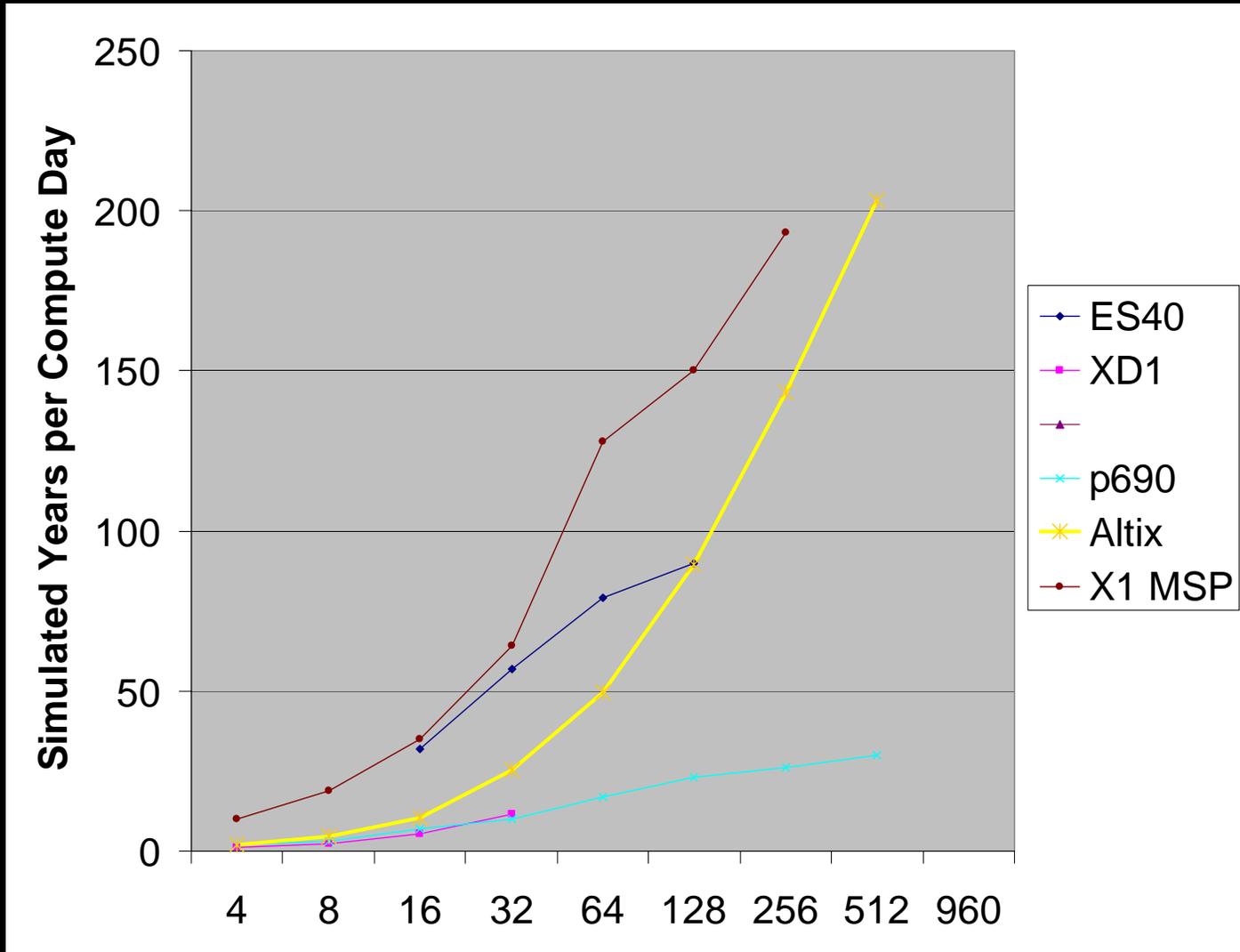


WRF v2.0.3 EM core

- Standard benchmark job, 425x300x35 grid
- Scales to 1024p, best total performance of all machines (compare to previous slide)



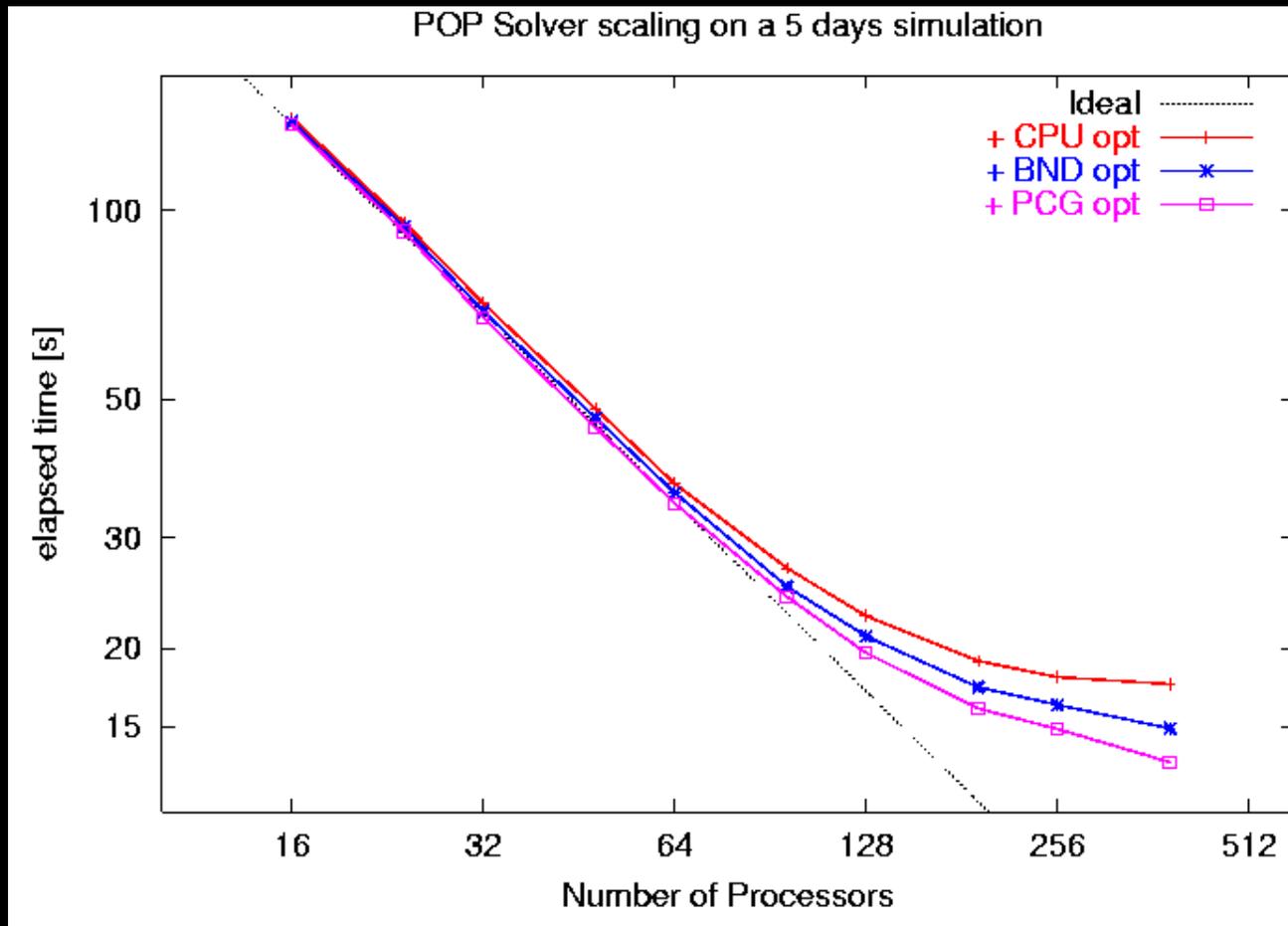
POP 1.4.3 on various systems. 1 degree problem



POP 1.4.3

(Optimization by reducing the # of synchronizations)

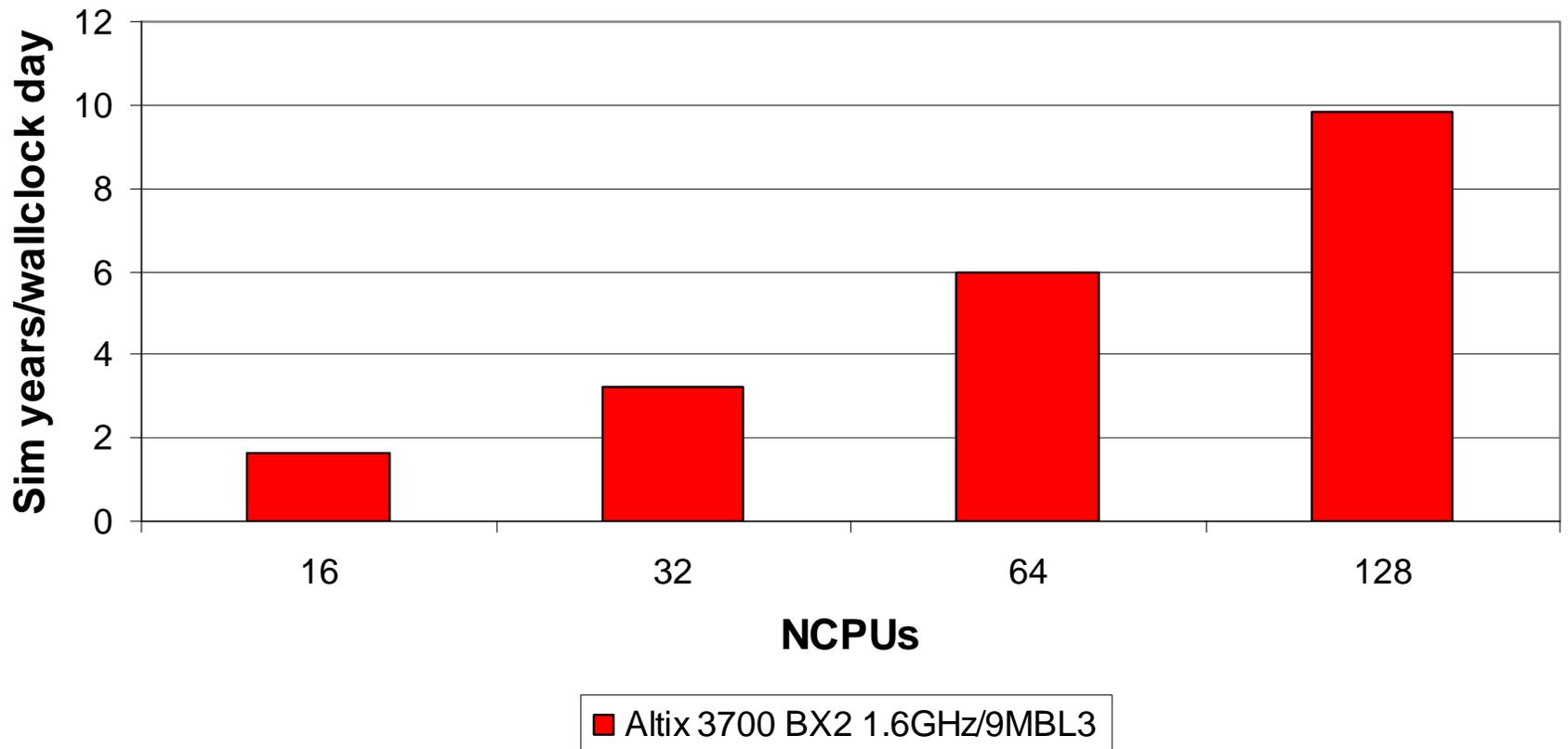
Scalability on Altix using Intel Compiler and SGI MPT library



Increasing Message length and reducing synchronization frequency improved the performance by 20% at 256 CPU

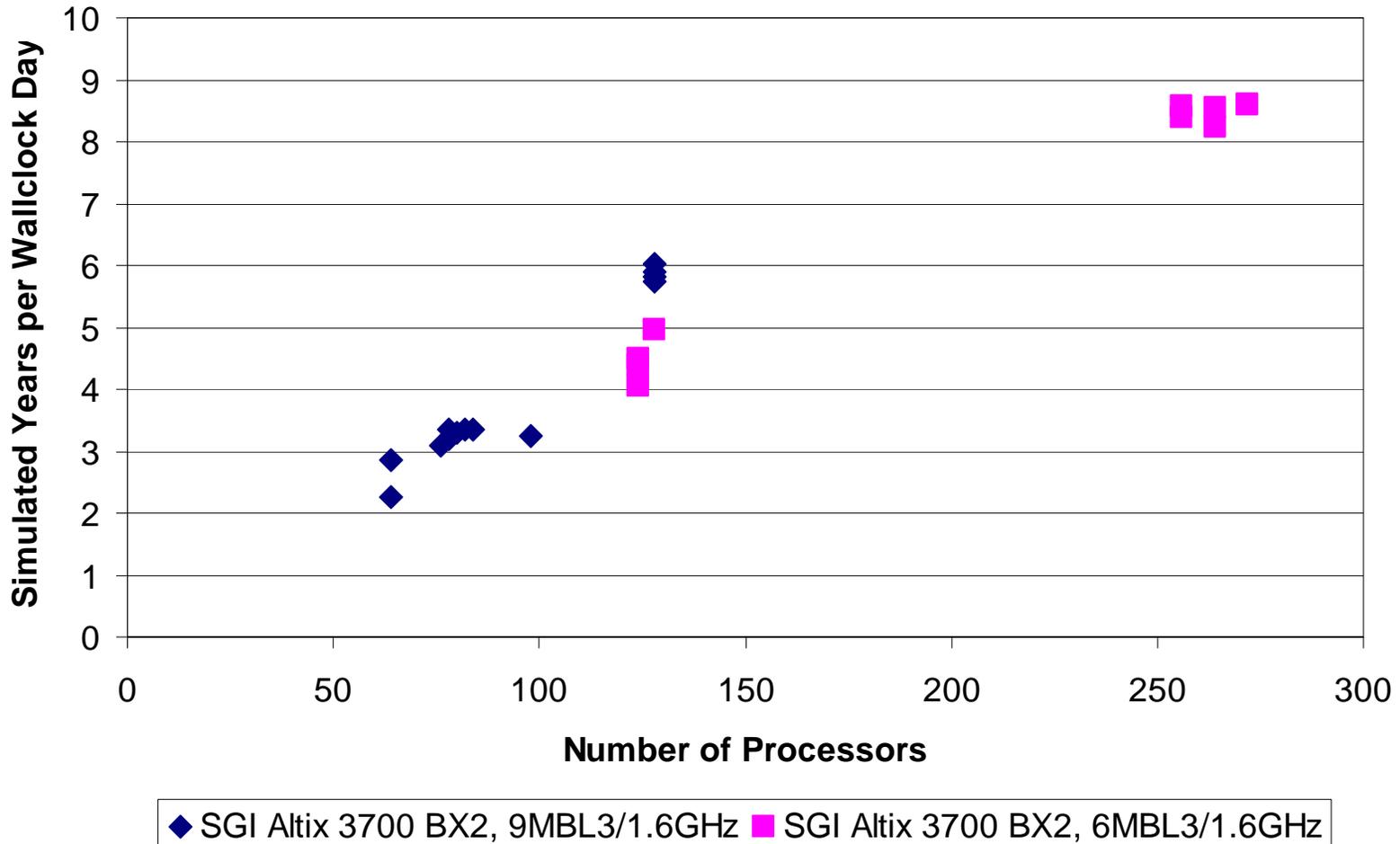
CAM 3.0

CAM 3.0_p1 T85 Simulation Speed



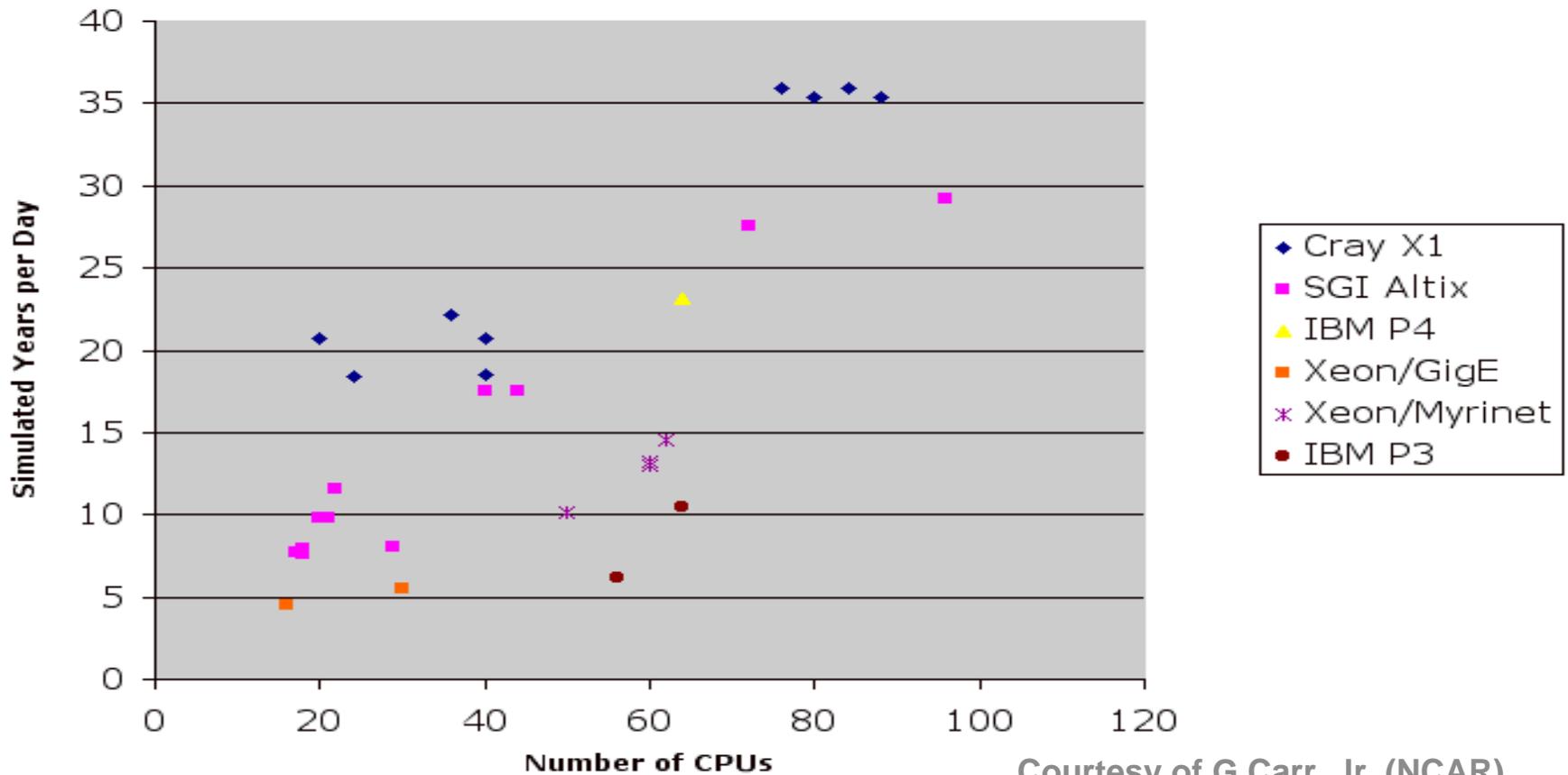
CCSM 3.0 T85_gx1v3 on the SGI Altix 3700 BX2

CCSM3 T85_gx1v3 Load Balancing Experiments



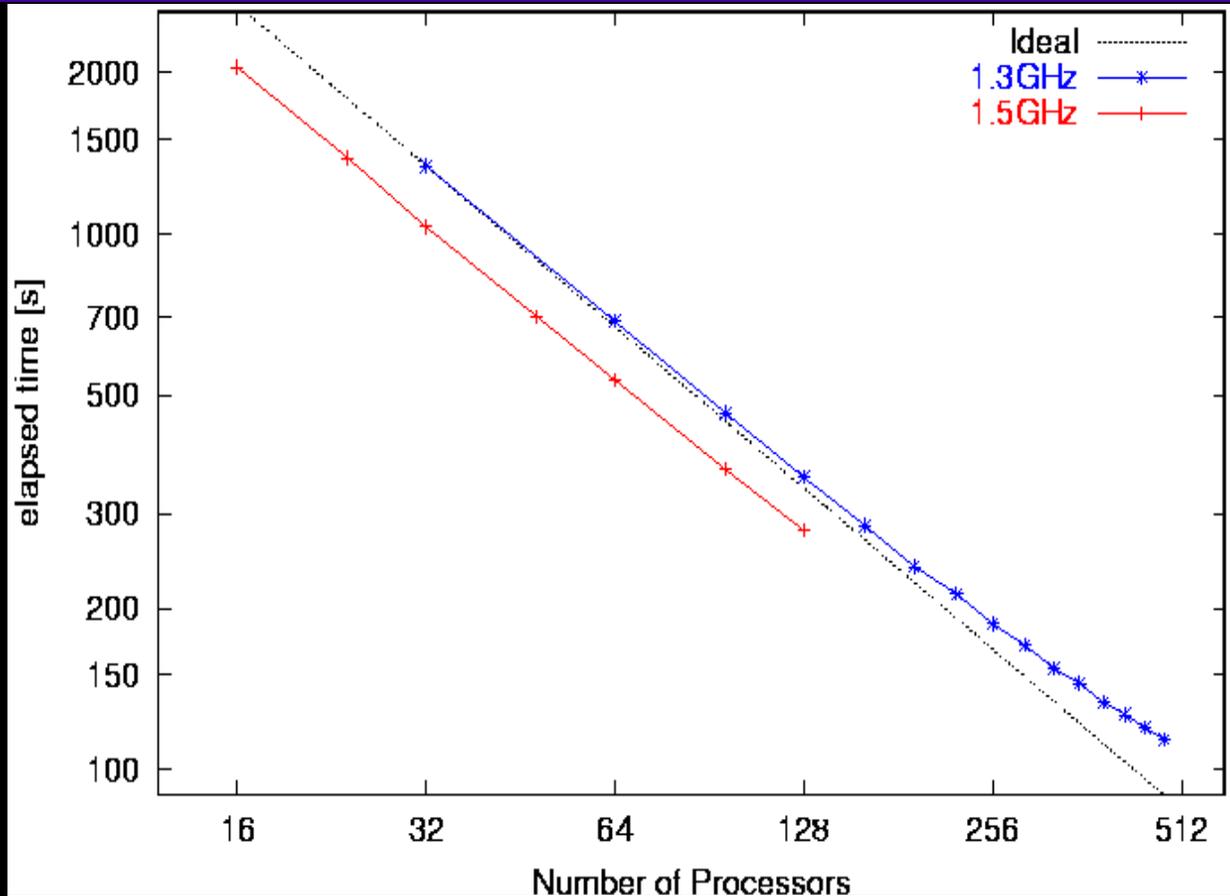
CCSM 3.0 on various systems

T31x3 Load Balance Experiments



Courtesy of G Carr, Jr. (NCAR)

IFS - Scalability on SGI Altix 3000



Itanium2 @1.5GHz is 1.3x faster than Itanium @1.3GHz because of the larger cache and higher clock rate

Climate and Weather Model Performance

- **SGI MPT library** takes advantage of **shared memory** to provide very low latency, high bandwidth MPI communication.
 - MPI codes perform very well
- **Globally addressable memory** allows additional optimizations that greatly improve scalability and performance.
- **Large shared memory** allows easy post-processing and analysis of large, high resolution data sets.