



# SPEC® MPIM2007 Result

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## SGI

SGI Altix ICE 8200EX  
(Intel Xeon X5570, 2.93 GHz)

SPECmpiM\_peak2007 = Not Run

SPECmpiM\_base2007 = 6.95

MPI2007 license: 4

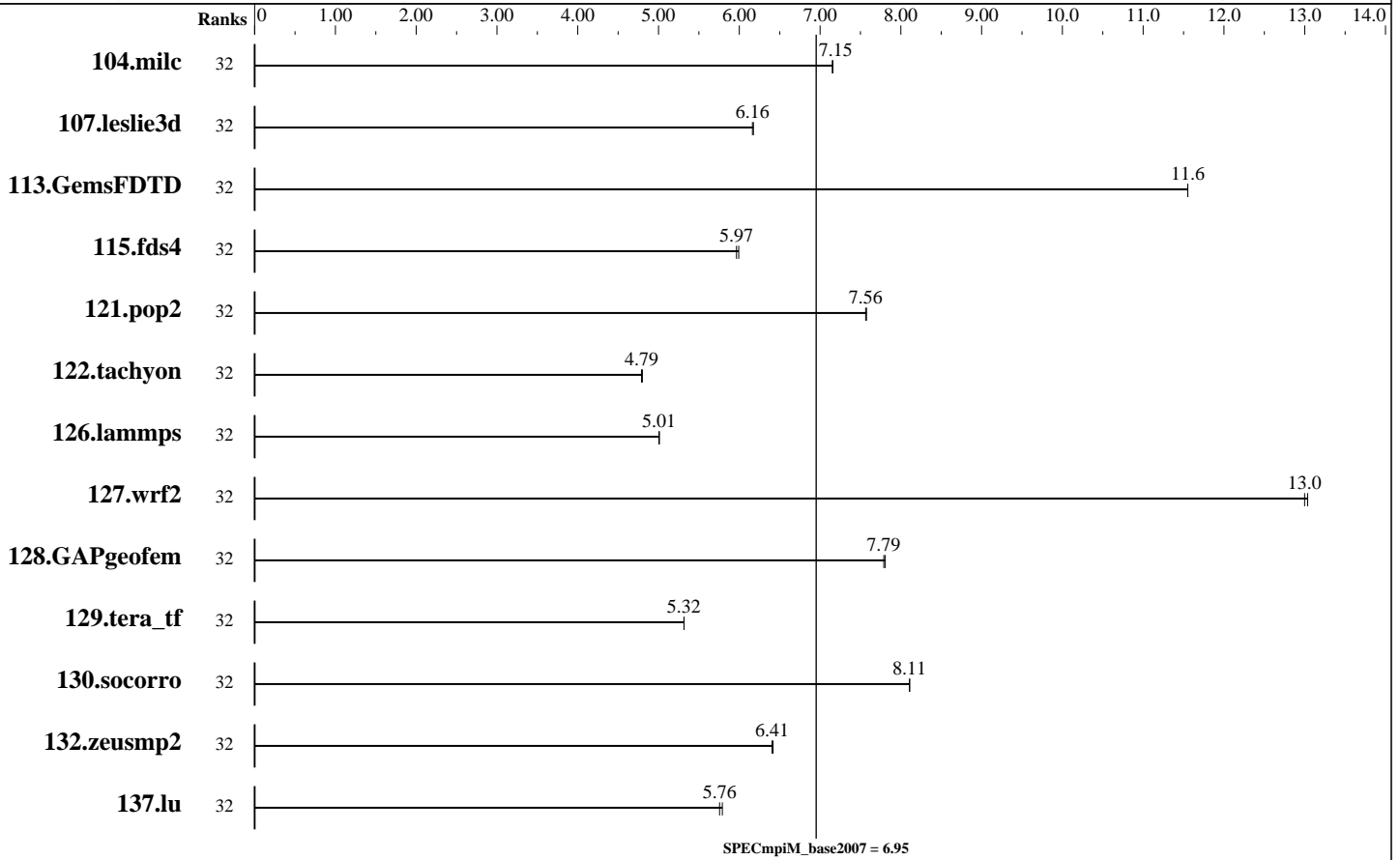
Test sponsor: SGI

Tested by: SGI

Test date: Feb-2009

Hardware Availability: Mar-2009

Software Availability: Jan-2009



## Results Table

Benchmark	Base							Peak						
	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
104.milc	32	<u>219</u>	<u>7.15</u>	219	7.16									
107.leslie3d	32	<u>847</u>	<u>6.16</u>	845	6.18									
113.GemsFDTD	32	546	11.6	<u>546</u>	<u>11.6</u>									
115.fds4	32	<u>327</u>	<u>5.97</u>	326	5.99									
121.pop2	32	<u>546</u>	<u>7.56</u>	545	7.57									
122.tachyon	32	583	4.80	<u>584</u>	<u>4.79</u>									
126.lammgs	32	<u>582</u>	<u>5.01</u>	582	5.01									
127.wrf2	32	<u>600</u>	<u>13.0</u>	598	13.0									
128.GAPgeofem	32	<u>265</u>	<u>7.79</u>	265	7.81									
129.tera_tf	32	<u>521</u>	<u>5.32</u>	521	5.32									

Table continues on next page. Results appear in the order in which they were run. Bold underlined text indicates a median measurement.



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### Results Table (Continued)

Benchmark	Base						Peak							
	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
130.socorro	32	<b><u>471</u></b>	<b><u>8.11</u></b>	471	8.11									
132.zeusmp2	32	<b><u>484</u></b>	<b><u>6.41</u></b>	483	6.42									
137.lu	32	<b><u>639</u></b>	<b><u>5.76</u></b>	635	5.79									

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

#### Hardware Summary

Type of System: Homogeneous  
 Compute Node: SGI Altix ICE 8200EX Compute Node  
 Interconnects: InfiniBand (MPI)  
 InfiniBand (I/O)  
 File Server Node: SGI InfiniteStorage Nexis 2000 NAS  
 Total Compute Nodes: 4  
 Total Chips: 8  
 Total Cores: 32  
 Total Threads: 64  
 Total Memory: 192 GB  
 Base Ranks Run: 32  
 Minimum Peak Ranks: --  
 Maximum Peak Ranks: --

#### Software Summary

C Compiler: Intel C Compiler for Linux  
 Version 10.1, Build 20080801  
 C++ Compiler: Intel C++ Compiler for Linux  
 Version 10.1, Build 20080801  
 Fortran Compiler: Intel Fortran Compiler for Linux  
 Version 10.1, Build 20080801  
 Base Pointers: 64-bit  
 Peak Pointers: 64-bit  
 MPI Library: SGI MPT 1.23  
 Other MPI Info: OFED 1.3.1  
 Pre-processors: None  
 Other Software: None

### Node Description: SGI Altix ICE 8200EX Compute Node

#### Hardware

Number of nodes: 4  
 Uses of the node: compute  
 Vendor: SGI  
 Model: SGI Altix ICE 8200EX (Intel Xeon X5570, 2.93 GHz)  
 CPU Name: Intel Xeon X5570  
 CPU(s) orderable: 1-2 chips  
 Chips enabled: 2  
 Cores enabled: 8  
 Cores per chip: 4  
 Threads per core: 2  
 CPU Characteristics: Intel Turbo Boost Technology up to 3.33 GHz,  
 6.4 GT/s QPI, Hyper-Threading enabled  
 CPU MHz: 2934  
 Primary Cache: 32 KB I + 32 KB D on chip per core  
 Secondary Cache: 256 KB I+D on chip per core  
 L3 Cache: 8 MB I+D on chip per chip  
 Other Cache: None  
 Memory: 48 GB (12\*4GB DDR3-1066 CL7 RDIMMs)  
 Disk Subsystem: None  
 Other Hardware: None  
 Adapter: Mellanox MT26418 ConnectX IB DDR  
 (PCIe x8 Gen2 5 GT/s)  
 Number of Adapters: 1

#### Software

Adapter: Mellanox MT26418 ConnectX IB DDR  
 (PCIe x8 Gen2 5 GT/s)  
 Adapter Driver: OFED-1.3.1  
 Adapter Firmware: 2.5.0  
 Operating System: SUSE Linux Enterprise Server 10 (x86\_64) SP2  
 Kernel 2.6.16.60-0.30-smp  
 Local File System: NFSv3  
 Shared File System: NFSv3 IPoIB  
 System State: Multi-user, run level 3  
 Other Software: SGI ProPack 6 for Linux Service Pack 2

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Hardware Availability: Mar-2009

Software Availability: Jan-2009

### Node Description: SGI Altix ICE 8200EX Compute Node

Slot Type: PCIe x8 Gen2  
Data Rate: InfiniBand 4x DDR  
Ports Used: 2  
Interconnect Type: InfiniBand

### Node Description: SGI InfiniteStorage Nexis 2000 NAS

#### Hardware

Number of nodes: 1  
Uses of the node: fileserver  
Vendor: SGI  
Model: SGI Altix XE 240 (Intel Xeon 5140, 2.33 GHz)  
CPU Name: Intel Xeon 5140  
CPU(s) orderable: 1-2 chips  
Chips enabled: 2  
Cores enabled: 4  
Cores per chip: 2  
Threads per core: 1  
CPU Characteristics: 1333 MHz FSB  
CPU MHz: 2328  
Primary Cache: 32 KB I + 32 KB D on chip per core  
Secondary Cache: 4 MB I+D on chip per chip  
L3 Cache: None  
Other Cache: None  
Memory: 24 GB (6\*4GB DDR2-400 DIMMS)  
Disk Subsystem: 7 TB RAID 5  
48 x 147 GB SAS (Seagate Cheetah 15000 rpm)  
Other Hardware: None  
Adapter: Mellanox MT25208 InfiniHost III Ex  
(PCIe x8 Gen1 2.5 GT/s)  
Number of Adapters: 2  
Slot Type: PCIe x8 Gen1  
Data Rate: InfiniBand 4x DDR  
Ports Used: 2  
Interconnect Type: InfiniBand

#### Software

Adapter: Mellanox MT25208 InfiniHost III Ex  
(PCIe x8 Gen1 2.5 GT/s)  
Adapter Driver: OFED-1.3  
Adapter Firmware: 5.3.0  
Operating System: SUSE Linux Enterprise Server 10 (x86\_64) SP1  
Kernel 2.6.16.54-0.2.5-smp  
Local File System: xfs  
Shared File System: --  
System State: Multi-user, run level 3  
Other Software: SGI ProPack 5 for Linux Service Pack 5

### Interconnect Description: InfiniBand (MPI)

#### Hardware

Vendor: Mellanox Technologies  
Model: MT26418 ConnectX  
Switch Model: Mellanox MT47396 InfiniScale III  
Number of Switches: 8  
Number of Ports: 24  
Data Rate: InfiniBand 4x DDR  
Firmware: 2020001

#### Software

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Tested by: SGI

Test date: Feb-2009

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Software Availability: Jan-2009

### Interconnect Description: InfiniBand (MPI)

Topology: Bristle hypercube with express links  
Primary Use: MPI traffic

### Interconnect Description: InfiniBand (I/O)

Hardware	
Vendor:	Mellanox Technologies
Model:	MT26418 ConnectX
Switch Model:	Mellanox MT47396 InfiniScale-III
Number of Switches:	8
Number of Ports:	24
Data Rate:	InfiniBand 4x DDR
Firmware:	2020001
Topology:	Bristle hypercube with express links
Primary Use:	I/O traffic

### Software

### Submit Notes

The config file option 'submit' was used.

### General Notes

Software environment:

setenv MPI\_REQUEST\_MAX 65536

Determines the maximum number of nonblocking sends and receives that can simultaneously exist for any single MPI process. MPI generates an error message if this limit (or the default, if not set) is exceeded. Default: 16384

setenv MPI\_TYPE\_MAX 32768

Determines the maximum number of data types that can simultaneously exist for any single MPI process. MPI generates an error message if this limit (or the default, if not set) is exceeded. Default: 1024

setenv MPI\_BUFS\_THRESHOLD 1

Determines whether MPT uses per-host or per-process message buffers for communicating with other hosts. Per-host buffers are generally faster but for jobs running across many hosts they can consume a prodigious amount of memory. MPT will use per-host buffers for jobs using up to and including this many hosts and will use per-process buffers for larger host counts. Default: 64

setenv MPI\_DSM\_DISTRIBUTE

Activates NUMA job placement mode. This mode ensures that each MPI process gets a unique CPU and physical memory on the node with which that CPU is associated. Currently, the CPUs are chosen by simply starting at relative CPU 0 and incrementing

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### General Notes (Continued)

until all MPI processes have been forked.

limit stacksize unlimited

Removes limits on the maximum size of the automatically-extended stack region of the current process and each process it creates.

PBS Pro batch scheduler ([www.altair.com](http://www.altair.com)) is used with placement sets to ensure each MPI job is assigned to a topologically compact set of nodes

BIOS settings:

AMI BIOS version 8.15

Hyper-Threading Technology enabled (default)

Intel Turbo Boost Technology enabled (default)

Intel Turbo Boost Technology activated in the OS via

/etc/init.d/acpid start

/etc/init.d/powersaved start

powersave -f

### Base Compiler Invocation

C benchmarks:

icc

C++ benchmarks:

126.lammps: icpc

Fortran benchmarks:

ifort

Benchmarks using both Fortran and C:

icc ifort

### Base Portability Flags

121.pop2: -DSPEC\_MPI\_CASE\_FLAG

127.wrf2: -DSPEC\_MPI\_CASE\_FLAG -DSPEC\_MPI\_LINUX

### Base Optimization Flags

C benchmarks:

-O3 -ipo -xT -no-prec-div

C++ benchmarks:

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## Base Optimization Flags (Continued)

126.lammps: -O3 -ipo -xT -no-prec-div -ansi-alias

Fortran benchmarks:

-O3 -ipo -xT -no-prec-div

Benchmarks using both Fortran and C:

-O3 -ipo -xT -no-prec-div

## Base Other Flags

C benchmarks:

-lmpi

C++ benchmarks:

126.lammps: -lmpi

Fortran benchmarks:

-lmpi

Benchmarks using both Fortran and C:

-lmpi

The flags file that was used to format this result can be browsed at

[http://www.spec.org/mpi2007/flags/EM64T\\_Intel101\\_flags.20080611.html](http://www.spec.org/mpi2007/flags/EM64T_Intel101_flags.20080611.html)

You can also download the XML flags source by saving the following link:

[http://www.spec.org/mpi2007/flags/EM64T\\_Intel101\\_flags.20080611.xml](http://www.spec.org/mpi2007/flags/EM64T_Intel101_flags.20080611.xml)

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For questions about this result, please contact the tester.  
For other inquiries, please contact [webmaster@spec.org](mailto:webmaster@spec.org).

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