



# SPEC<sup>®</sup> MPIM2007 Result

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## SGI

SGI Altix ICE 8400EX  
(Intel Xeon X5680, 3.33 GHz)

SPECmpiM\_peak2007 = Not Run

SPECmpiM\_base2007 = 32.3

MPI2007 license: 4

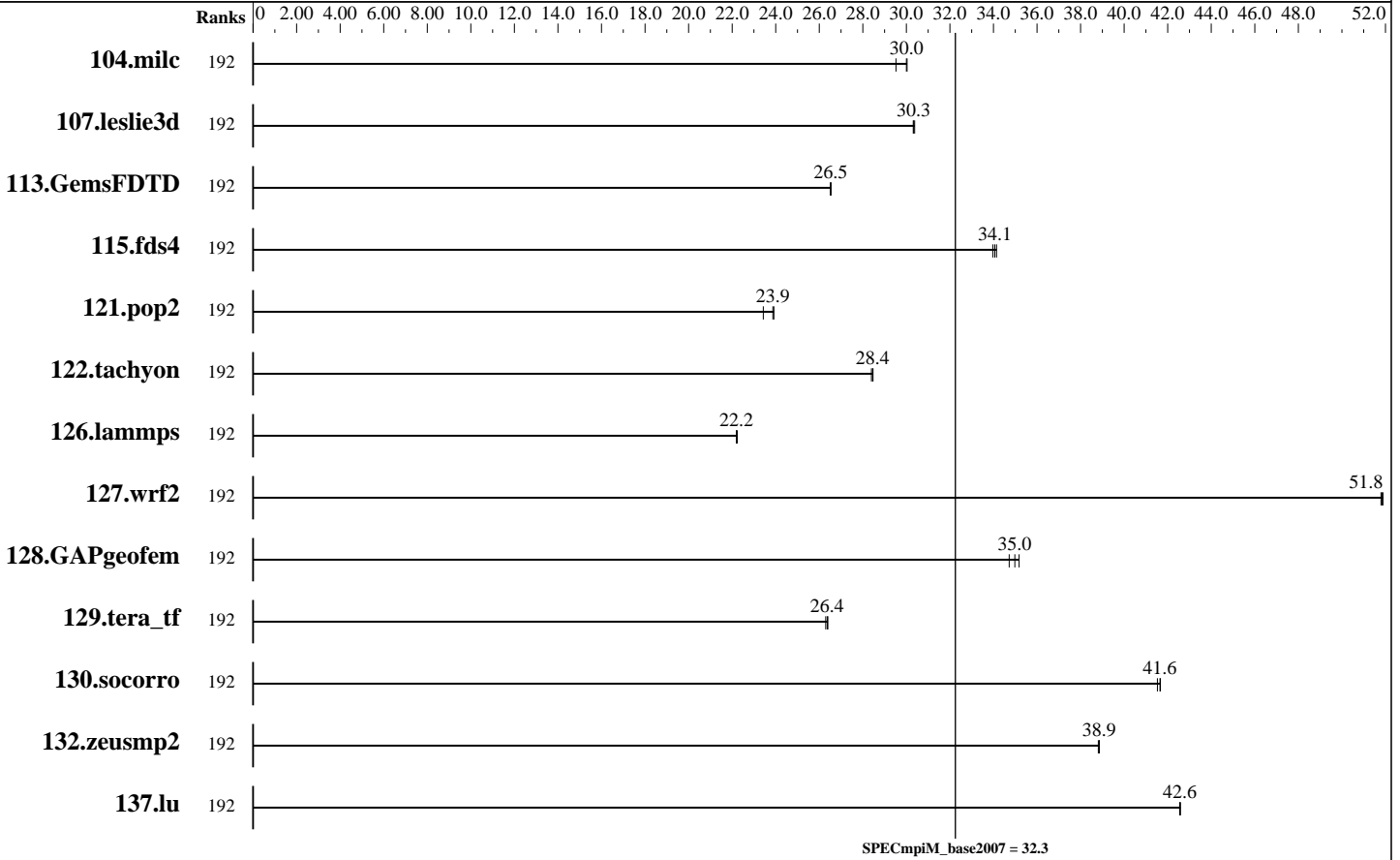
Test sponsor: SGI

Tested by: SGI

Test date: Sep-2010

Hardware Availability: May-2010

Software Availability: Oct-2010



## Results Table

Benchmark	Base								Peak							
	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio		
104.milc	192	53.0	29.5	52.1	30.0	<u>52.2</u>	<u>30.0</u>									
107.leslie3d	192	172	30.3	172	30.4	<u>172</u>	<u>30.3</u>									
113.GemsFDTD	192	238	26.5	<u>238</u>	<u>26.5</u>	238	26.5									
115.fds4	192	57.1	34.1	57.4	34.0	<u>57.3</u>	<u>34.1</u>									
121.pop2	192	173	23.9	176	23.4	<u>173</u>	<u>23.9</u>									
122.tachyon	192	98.5	28.4	<u>98.3</u>	<u>28.4</u>	98.3	28.5									
126.lammps	192	131	22.2	<u>131</u>	<u>22.2</u>	131	22.2									
127.wrf2	192	151	51.8	150	51.9	<u>150</u>	<u>51.8</u>									
128.GAPgeofem	192	59.5	34.7	58.7	35.2	<u>59.0</u>	<u>35.0</u>									
129.tera_tf	192	<u>105</u>	<u>26.4</u>	105	26.4	105	26.3									

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	192	<u>91.7</u>	<u>41.6</u>	91.6	41.7	91.9	41.5									
132.zeusmp2	192	79.9	38.8	<u>79.9</u>	<u>38.9</u>	79.9	38.9									
137.lu	192	86.4	42.5	86.3	42.6	<u>86.4</u>	<u>42.6</u>									

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 8400EX Compute Node  
 Interconnects: InfiniBand (MPI)  
 InfiniBand (I/O)  
 File Server Node: SGI InfiniteStorage Nexis 2000 NAS  
 Total Compute Nodes: 16  
 Total Chips: 32  
 Total Cores: 192  
 Total Threads: 384  
 Total Memory: 384 GB  
 Base Ranks Run: 192  
 Minimum Peak Ranks: --  
 Maximum Peak Ranks: --

#### Software Summary

C Compiler: Intel C Compiler for Linux  
 Version 11.1, Build 20100414  
 C++ Compiler: Intel C++ Compiler for Linux  
 Version 11.1, Build 20100414  
 Fortran Compiler: Intel Fortran Compiler for Linux  
 Version 11.1, Build 20100414  
 Base Pointers: 64-bit  
 Peak Pointers: 64-bit  
 MPI Library: SGI MPT 2.02 Beta  
 Other MPI Info: OFED 1.4.2  
 Pre-processors: None  
 Other Software: None

### Node Description: SGI Altix ICE 8400EX Compute Node

#### Hardware

Number of nodes: 16  
 Uses of the node: compute  
 Vendor: SGI  
 Model: SGI Altix ICE 8400EX (Intel Xeon X5680, 3.33 GHz)  
 CPU Name: Intel Xeon X5680  
 CPU(s) orderable: 1-2 chips  
 Chips enabled: 2  
 Cores enabled: 12  
 Cores per chip: 6  
 Threads per core: 2  
 CPU Characteristics: Six Core, 3.33 GHz, 6.4 GT/s QPI  
 Intel Turbo Boost Technology up to 3.6 GHz  
 Hyper-Threading Technology enabled  
 CPU MHz: 3333  
 Primary Cache: 32 KB I + 32 KB D on chip per core  
 Secondary Cache: 256 KB I+D on chip per core  
 L3 Cache: 12 MB I+D on chip per chip  
 Other Cache: None  
 Memory: 24 GB (6\*4GB DDR3-1333 CL9 RDIMMs)  
 Disk Subsystem: None  
 Other Hardware: None  
 Adapter: Mellanox MT26428 ConnectX IB QDR  
 (PCIe x8 Gen2 5 GT/s)  
 Number of Adapters: 2

#### Software

Adapter: Mellanox MT26428 ConnectX IB QDR  
 (PCIe x8 Gen2 5 GT/s)  
 Adapter Driver: OFED-1.4.2  
 Adapter Firmware: 2.7.200  
 Operating System: SUSE Linux Enterprise Server 11 SP1,  
 Kernel 2.6.32.13-0.4-default  
 Local File System: NFSv3  
 Shared File System: NFSv3 IPoIB  
 System State: Multi-user, run level 3  
 Other Software: SGI ProPack 7 for Linux Service Pack 1,  
 SGI Tempo V 2.1

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Test date: Sep-2010  
Hardware Availability: May-2010  
Software Availability: Oct-2010

### Node Description: SGI Altix ICE 8400EX Compute Node

Slot Type: PCIe x8 Gen2  
Data Rate: InfiniBand 4x QDR  
Ports Used: 1  
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 270 (Intel Xeon X5670, 2.93 GHz)  
CPU Name: Intel Xeon X5670  
CPU(s) orderable: 1-2 chips  
Chips enabled: 2  
Cores enabled: 12  
Cores per chip: 6  
Threads per core: 2  
CPU Characteristics: Intel Turbo Boost Technology up to 3.33 GHz  
Hyper-Threading Technology enabled  
CPU MHz: 2933  
Primary Cache: 32 KB I + 32 KB D on chip per core  
Secondary Cache: 256 KB I+D on chip per chip  
L3 Cache: 12 MB I+D on chip per chip  
Other Cache: None  
Memory: 24 GB (6\*4GB DDR3-1333 CL9 DIMMs)  
Disk Subsystem: 8.8 TB RAID 5  
60 x 146 GB SAS (Seagate Cheetah 15K.5)  
Other Hardware: None  
Adapter: Mellanox MT26418 ConnectX, MT25208 InfiniHost III Ex  
(PCIe x8 Gen2 5 GT/s, PCIe x8 Gen1 2.5 GT/s)  
Number of Adapters: 2  
Slot Type: PCIe x8 Gen2, PCIe x8 Gen1  
Data Rate: InfiniBand 4x DDR  
Ports Used: 2  
Interconnect Type: InfiniBand

#### Software

Adapter: Mellanox MT26418 ConnectX, MT25208 InfiniHost III Ex  
(PCIe x8 Gen2 5 GT/s, PCIe x8 Gen1 2.5 GT/s)  
Adapter Driver: OFED-1.4.0  
Adapter Firmware: 2.6.0 and 5.2.0  
Operating System: SUSE Linux Enterprise Server 11 (x86\_64)  
Kernel 2.6.27.19-5-default  
Local File System: xfs  
Shared File System: --  
System State: Multi-user, run level 3  
Other Software: SGI Foundation Software 2

### Interconnect Description: InfiniBand (MPI)

#### Hardware

Vendor: Mellanox Technologies and SGI  
Model: MT26428 ConnectX  
Switch Model: SGI QDR\_1.5\_HYPR\_2454 with Mellanox Device 48438  
(Infiniscale IV)  
Number of Switches: 32  
Number of Ports: 36

#### Software

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Test sponsor: SGI

Tested by: SGI

Test date: Sep-2010

Hardware Availability: May-2010

Software Availability: Oct-2010

### Interconnect Description: InfiniBand (MPI)

Data Rate: InfiniBand 4x QDR  
Firmware: 5030005  
Topology: Enhanced Hypercube  
Primary Use: MPI traffic

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

	Hardware	Software
Vendor:	Mellanox Technologies and SGI	
Model:	MT26428 ConnectX	
Switch Model:	SGI QDR_1.5_HYPR_2454 with Mellanox Device 48438 (Infiniscale IV)	
Number of Switches:	16	
Number of Ports:	36	
Data Rate:	InfiniBand 4x QDR	
Firmware:	5030005	
Topology:	Enhanced Hypercube	
Primary Use:	I/O traffic	

### Submit Notes

The config file option 'submit' was used.

### General Notes

Software environment:  
export MPI\_REQUEST\_MAX=65536  
export MPI\_TYPE\_MAX=32768  
export MPI\_BUFS\_THRESHOLD=1  
export MPI\_IB\_RAILS=2  
ulimit -s unlimited

BIOS settings:  
AMI BIOS version 080016  
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

Job Placement:  
Each MPI job was assigned to a topologically compact set of nodes, i.e. the minimal needed number of switches was used for each job: 2 switches for 96 ranks, 4 switches for 192 ranks, 8 switches for 384 ranks,

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## General Notes (Continued)

16 switches for 768 ranks, 32 switches for 1536 ranks.

## 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 -xSSE4.2 -no-prec-div

C++ benchmarks:  
126.lammps: -O3 -xSSE4.2 -no-prec-div -ansi-alias

Fortran benchmarks:  
-O3 -xSSE4.2 -no-prec-div

Benchmarks using both Fortran and C:  
-O3 -xSSE4.2 -no-prec-div

## Base Other Flags

C benchmarks:  
-lmpi

C++ benchmarks:

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## Base Other Flags (Continued)

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/SGI\\_x86\\_64\\_Intel111\\_flags.html](http://www.spec.org/mpi2007/flags/SGI_x86_64_Intel111_flags.html)

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

[http://www.spec.org/mpi2007/flags/SGI\\_x86\\_64\\_Intel111\\_flags.xml](http://www.spec.org/mpi2007/flags/SGI_x86_64_Intel111_flags.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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