



# SPEC® MPIM2007 Result

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## SGI

SGI Altix ICE 8400EX  
(AMD Opteron 6282 SE, 2.6GHz)

SPECmpiM\_peak2007 = Not Run

SPECmpiM\_base2007 = 32.2

MPI2007 license: 4

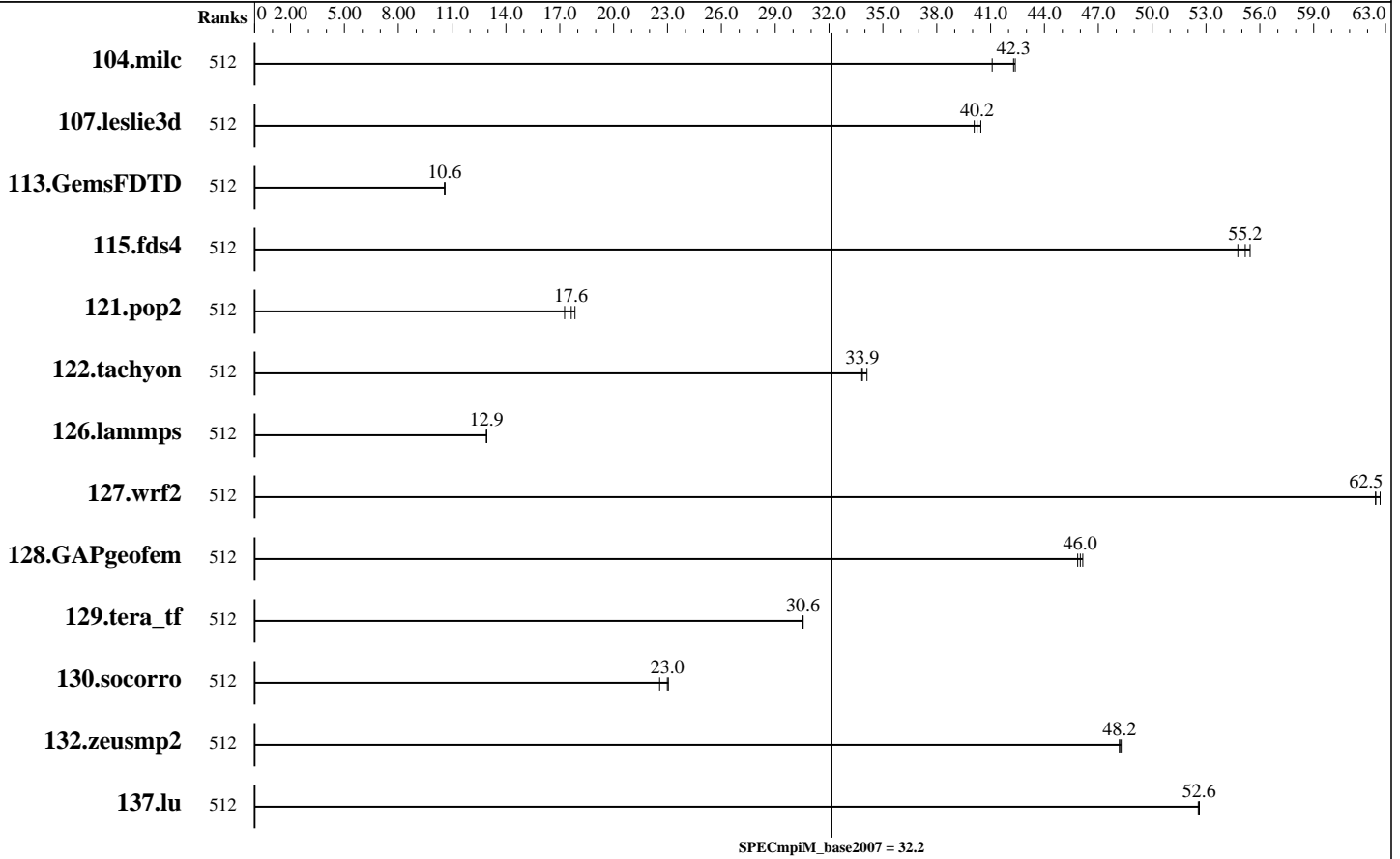
Test sponsor: SGI

Tested by: SGI

Test date: Feb-2012

Hardware Availability: Nov-2011

Software Availability: Nov-2011



## Results Table

Benchmark	Base								Peak							
	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio		
104.milc	512	38.1	41.1	<b><u>37.0</u></b>	<b><u>42.3</u></b>	36.9	42.4									
107.leslie3d	512	129	40.5	<b><u>130</u></b>	<b><u>40.2</u></b>	130	40.1									
113.GemsFDTD	512	<b><u>596</u></b>	<b><u>10.6</u></b>	595	10.6	596	10.6									
115.fds4	512	35.2	55.5	35.6	54.8	<b><u>35.4</u></b>	<b><u>55.2</u></b>									
121.pop2	512	239	17.3	231	17.8	<b><u>234</u></b>	<b><u>17.6</u></b>									
122.tachyon	512	<b><u>82.6</u></b>	<b><u>33.9</u></b>	82.0	34.1	82.7	33.8									
126.lammps	512	225	12.9	<b><u>226</u></b>	<b><u>12.9</u></b>	226	12.9									
127.wrf2	512	124	62.7	125	62.4	<b><u>125</u></b>	<b><u>62.5</u></b>									
128.GAPgeofem	512	44.8	46.1	45.0	45.9	<b><u>44.9</u></b>	<b><u>46.0</u></b>									
129.tera_tf	512	90.7	30.5	90.6	30.6	<b><u>90.6</u></b>	<b><u>30.6</u></b>									

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	512	<b>166</b>	<b>23.0</b>	169	22.6	166	23.0							
132.zeusmp2	512	64.3	48.3	<b>64.4</b>	<b>48.2</b>	64.4	48.2							
137.lu	512	69.9	52.6	69.9	52.6	<b>69.9</b>	<b>52.6</b>							

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  
 Interconnect: InfiniBand (MPI and I/O)  
 File Server Node: SGI InfiniteStorage 4000  
 Total Compute Nodes: 16  
 Total Chips: 32  
 Total Cores: 512  
 Total Threads: 512  
 Total Memory: 2 TB  
 Base Ranks Run: 512  
 Minimum Peak Ranks: --  
 Maximum Peak Ranks: --

#### Software Summary

C Compiler: Intel C Compiler for Linux, Version 11.1.073 Build 20100806  
 C++ Compiler: Intel C++ Compiler for Linux, Version 11.1.073 Build 20100806  
 Fortran Compiler: Intel Fortran Compiler for Linux, Version 11.1.073 Build 20100806  
 Base Pointers: 64-bit  
 Peak Pointers: 64-bit  
 MPI Library: SGI MPT 2.05  
 Other MPI Info: OFED 1.5.2  
 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 (AMD Opteron 6282 SE, 2.6GHz)  
 CPU Name: AMD Opteron 6282 SE  
 CPU(s) orderable: 1-2 chips  
 Chips enabled: 2  
 Cores enabled: 32  
 Cores per chip: 16  
 Threads per core: 1  
 CPU Characteristics: 16 cores/chip, 2.6 GHz  
 AMD Turbo CORE technology up to 3.30 GHz  
 CPU MHz: 2600  
 Primary Cache: 512 KB I on chip per chip,  
 64 KB I shared / 2 cores;  
 16 KB D on chip per core  
 Secondary Cache: 16 MB I+D on chip per chip, 2 MB I+D on chip per core  
 L3 Cache: 16 MB I+D on chip per chip, 8 MB shared / 8 cores  
 Other Cache: None  
 Memory: 128 GB (16 x 8 GB 2Rx4 PC3-12800R-11, ECC)  
 Disk Subsystem: None  
 Other Hardware: None  
 Adapter: Mellanox MT26428 ConnectX IB QDR (PCIe x8 Gen2 5 GT/s)

#### Software

Adapter: Mellanox MT26428 ConnectX IB QDR (PCIe x8 Gen2 5 GT/s)  
 Adapter Driver: OFED-1.5.2  
 Adapter Firmware: 2.7.0  
 Operating System: SUSE Linux Enterprise Server 11 SP1 (x86\_64) Kernel 2.6.32.46-0.3-default #1 SMP  
 Local File System: NFSv3  
 Shared File System: NFSv3 IPoIB  
 System State: Run level 3 (Multi-User)  
 Other Software: SGI Performance Suite 1.3, Build 705rp8.sles11-1111092106  
 SGI Tempo Compute Node 2.5, Build 705r10.sles11-1111092111

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Hardware Availability: Nov-2011

Software Availability: Nov-2011

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

Number of Adapters: 1  
Slot Type: PCIe x8 Gen2  
Data Rate: InfiniBand 4x QDR  
Ports Used: 2  
Interconnect Type: InfiniBand

### Node Description: SGI InfiniteStorage 4000

#### Hardware

Number of nodes: 1  
Uses of the node: fileserver  
Vendor: SGI  
Model: SGI Altix 450 (Intel Itanium 2, 1.6GHz)  
CPU Name: Intel Itanium 2 9030  
CPU(s) orderable: 2-38 chips  
Chips enabled: 2  
Cores enabled: 4  
Cores per chip: 2  
Threads per core: 1  
CPU Characteristics: 1.6GHz/8MB, 533MHz FSB  
CPU MHz: 1600  
Primary Cache: 16 KB I + 16 KB D on chip per core  
Secondary Cache: 1 MB I + 256 KB D on chip per core  
L3 Cache: 4 MB I+D on chip per core  
Other Cache: None  
Memory: 24 GB (12 x 2 GB, 2Rx4 PC2-3200-3, ECC)  
Disk Subsystem: 16 TB RAID 5  
32 x 500 GB SATA (Seagate Barracuda 7.2K)  
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-1.4.2  
Adapter Firmware: 5.3.0  
Operating System: SUSE Linux Enterprise Server 11 SP1 (ia64)  
Kernel 2.6.32.12-0.7-default  
Local File System: xfs  
Shared File System: --  
System State: Run Level 3 (Multi-User)  
Other Software: SGI ProPack 7SP1 for Linux,  
Build 701r2.sles11-1005242307

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

#### Hardware

Vendor: Mellanox Technologies and SGI  
Model: None  
Switch Model: SGI QDR\_1.5\_HYPR\_2454 with Mellanox Device 48438  
(Infiniscale IV)  
Number of Switches: 4  
Number of Ports: 36

#### Software

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

Data Rate: InfiniBand 4x QDR  
Firmware: 5040005  
Topology: Enhanced Hypercube  
Primary Use: MPI and 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 2.0

Job Placement:  
In the base run, each MPI job is assigned to a topologically compact set of nodes, i.e. the minimal needed number of switches was used for each job: 2 switch for up to 256 ranks, 4 switches for 512 ranks.

Additional notes regarding interconnect:  
The Infiniband network consists of two independent planes, with half the switches in the system allocated to each plane. I/O traffic is restricted to one plane, while MPI traffic can use both planes.

SGI manufactures its own switch blades using unmodified Mellanox switch ASICs. The test system has SGI QDR\_1.5\_HYPR\_2454 switch with Mellanox 36-port QDR Infiniband switch Device 48438 (InfiniScale IV).

## Base Compiler Invocation

C benchmarks:  
icc

C++ benchmarks:

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## Base Compiler Invocation (Continued)

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 -xSSE2 -ipo -no-prec-div

C++ benchmarks:

126.lammps: -O3 -xSSE2 -ipo -no-prec-div -ansi-alias

Fortran benchmarks:

-O3 -xSSE2 -ipo -no-prec-div

Benchmarks using both Fortran and C:

-O3 -xSSE2 -ipo -no-prec-div

## Base Other Flags

C benchmarks:

-lmpi

C++ benchmarks:

126.lammps: -lmpi

Fortran benchmarks:

-lmpi

Benchmarks using both Fortran and C:

-lmpi



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

[http://www.spec.org/mpi2007/flags/SGI\\_x86\\_64\\_Intel1111\\_flags.20120720.html](http://www.spec.org/mpi2007/flags/SGI_x86_64_Intel1111_flags.20120720.html)

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

[http://www.spec.org/mpi2007/flags/SGI\\_x86\\_64\\_Intel1111\\_flags.20120720.xml](http://www.spec.org/mpi2007/flags/SGI_x86_64_Intel1111_flags.20120720.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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