



# SPEC® MPIM2007 Result

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## SGI

SGI Altix ICE 8400EX  
(Intel Xeon X5690, 3.46 GHz)

SPECmpiM\_peak2007 = Not Run

SPECmpiM\_base2007 = 18.6

MPI2007 license: 4

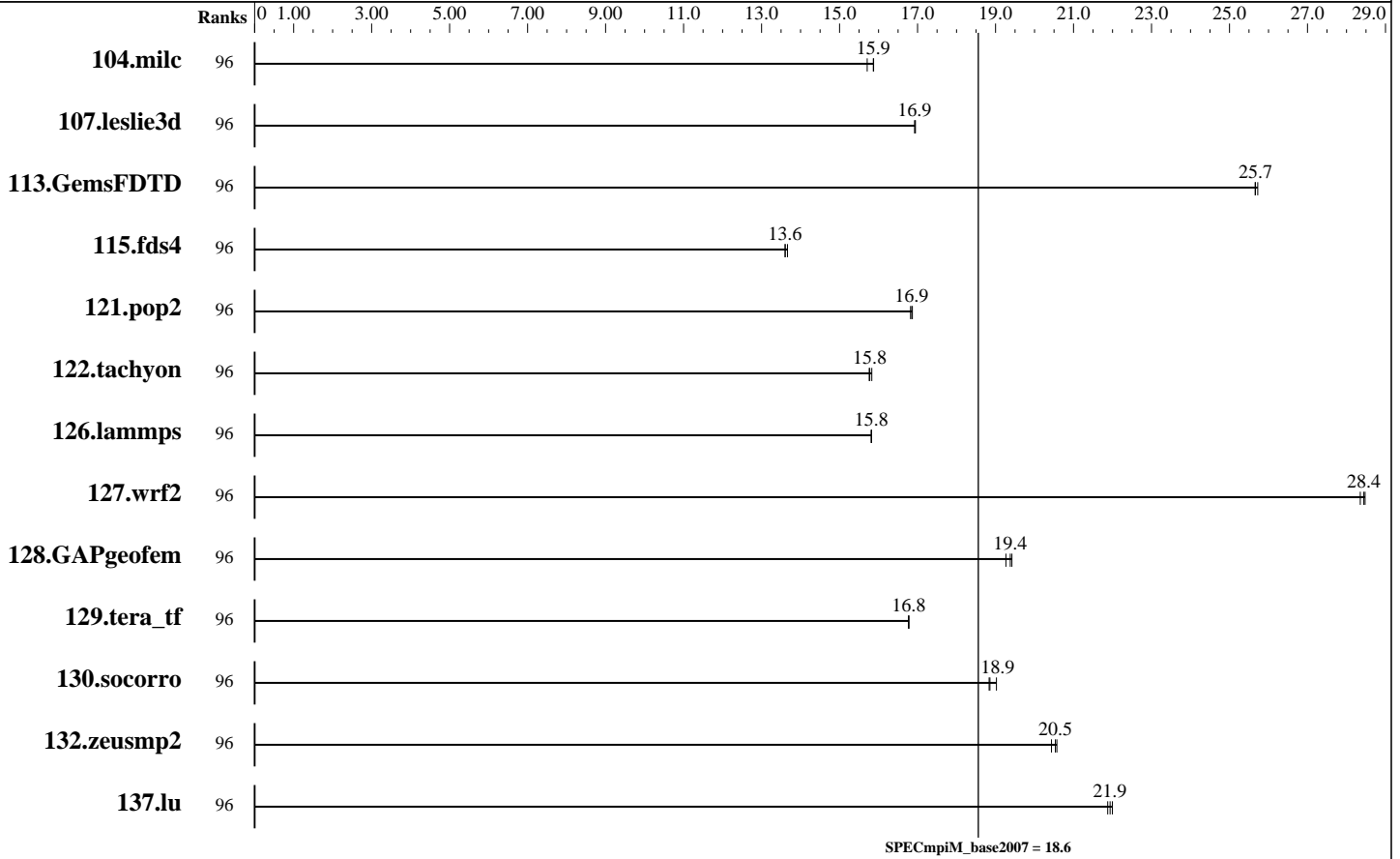
Test sponsor: SGI

Tested by: SGI

Test date: Jun-2011

Hardware Availability: Feb-2011

Software Availability: Aug-2011



## Results Table

Benchmark	Base								Peak							
	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio		
104.milc	96	99.6	15.7	<b><u>98.6</u></b>	<b><u>15.9</u></b>	98.6	15.9									
107.leslie3d	96	<b><u>308</u></b>	<b><u>16.9</u></b>	308	16.9	308	16.9									
113.GemsFDTD	96	<b><u>246</u></b>	<b><u>25.7</u></b>	245	25.7	246	25.7									
115.fds4	96	143	13.6	143	13.7	<b><u>143</u></b>	<b><u>13.6</u></b>									
121.pop2	96	<b><u>245</u></b>	<b><u>16.9</u></b>	245	16.9	245	16.8									
122.tachyon	96	177	15.8	177	15.8	<b><u>177</u></b>	<b><u>15.8</u></b>									
126.lammps	96	184	15.8	184	15.8	<b><u>184</u></b>	<b><u>15.8</u></b>									
127.wrf2	96	274	28.5	<b><u>274</u></b>	<b><u>28.4</u></b>	275	28.4									
128.GAPgeofem	96	107	19.3	<b><u>107</u></b>	<b><u>19.4</u></b>	106	19.4									
129.tera_tf	96	165	16.8	165	16.8	<b><u>165</u></b>	<b><u>16.8</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	96	<u>202</u>	<u>18.9</u>	203	18.8	201	19.0									
132.zeusmp2	96	152	20.4	<u>151</u>	<u>20.5</u>	151	20.6									
137.lu	96	<u>168</u>	<u>21.9</u>	168	21.9	167	22.0									

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 Nexis 2000 NAS  
 Total Compute Nodes: 8  
 Total Chips: 16  
 Total Cores: 96  
 Total Threads: 192  
 Total Memory: 192 GB  
 Base Ranks Run: 96  
 Minimum Peak Ranks: --  
 Maximum Peak Ranks: --

#### Software Summary

C Compiler: Intel C++ Composer XE 2011 for Linux, Version 12.0.3.174 Build 20110309  
 C++ Compiler: Intel C++ Composer XE 2011 for Linux, Version 12.0.3.174 Build 20110309  
 Fortran Compiler: Intel Fortran Composer XE 2011 for Linux, Version 12.0.3.174 Build 20110309  
 Base Pointers: 64-bit  
 Peak Pointers: 64-bit  
 MPI Library: SGI MPT 2.04 Patch 10789  
 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: 8  
 Uses of the node: compute  
 Vendor: SGI  
 Model: SGI Altix ICE 8400EX (Intel Xeon X5690, 3.46 GHz)  
 CPU Name: Intel Xeon X5690  
 CPU(s) orderable: 1-2 chips  
 Chips enabled: 2  
 Cores enabled: 12  
 Cores per chip: 6  
 Threads per core: 2  
 CPU Characteristics: Six Core, 3.46 GHz, 6.4 GT/s QPI  
 Intel Turbo Boost Technology up to 3.73 GHz  
 Hyper-Threading Technology enabled  
 CPU MHz: 3467  
 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 x 4 GB 2Rx4 PC3-10600R-9, ECC)  
 Disk Subsystem: None  
 Other Hardware: None  
 Adapter: Mellanox MT26428 ConnectX IB QDR (PCIe x8 Gen2 5 GT/s)  
 Number of Adapters: 2  
 Slot Type: PCIe x8 Gen2

#### Software

Adapter: Mellanox MT26428 ConnectX IB QDR (PCIe x8 Gen2 5 GT/s)  
 Adapter Driver: OFED-1.4.2  
 Adapter Firmware: 2.7.8200  
 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 7SP1 for Linux, Build 701r3.sles11-1005252113  
 SGI Tempo Compute Node 2.1, Build 701r3.sles11-1005252113

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Test date: Jun-2011  
Hardware Availability: Feb-2011  
Software Availability: Aug-2011

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

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: 96 GB (12\*8 GB 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 MT26428 ConnectX IB QDR  
(PCIe x8 Gen2 5 GT/s)  
Number of Adapters: 2  
Slot Type: PCIe x8 Gen2  
Data Rate: InfiniBand 4x QDR  
Ports Used: 2  
Interconnect Type: InfiniBand

#### Software

Adapter: Mellanox MT26428 ConnectX IB QDR  
(PCIe x8 Gen2 5 GT/s)  
Adapter Driver: OFED-1.4.0  
Adapter Firmware: 2.7.0  
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, Build  
700r3.sles11-1004061553

### 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: 2  
Number of Ports: 36  
Data Rate: InfiniBand 4x QDR

#### Software

Continued on next page



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

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 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 up to 96 ranks, 4 switches for 192 ranks, 8 switches for 384 ranks, 16 switches for 768 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.

### 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 -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:

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\\_Intel12\\_flags.html](http://www.spec.org/mpi2007/flags/SGI_x86_64_Intel12_flags.html)

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

[http://www.spec.org/mpi2007/flags/SGI\\_x86\\_64\\_Intel12\\_flags.xml](http://www.spec.org/mpi2007/flags/SGI_x86_64_Intel12_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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