



# SPEC<sup>®</sup> MPIL2007 Result

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## SGI

SGI Altix ICE 8400EX  
(Intel Xeon X5670, 2.93 GHz)

SPECmpiL\_peak2007 = Not Run

SPECmpiL\_base2007 = 21.3

MPI2007 license: 4

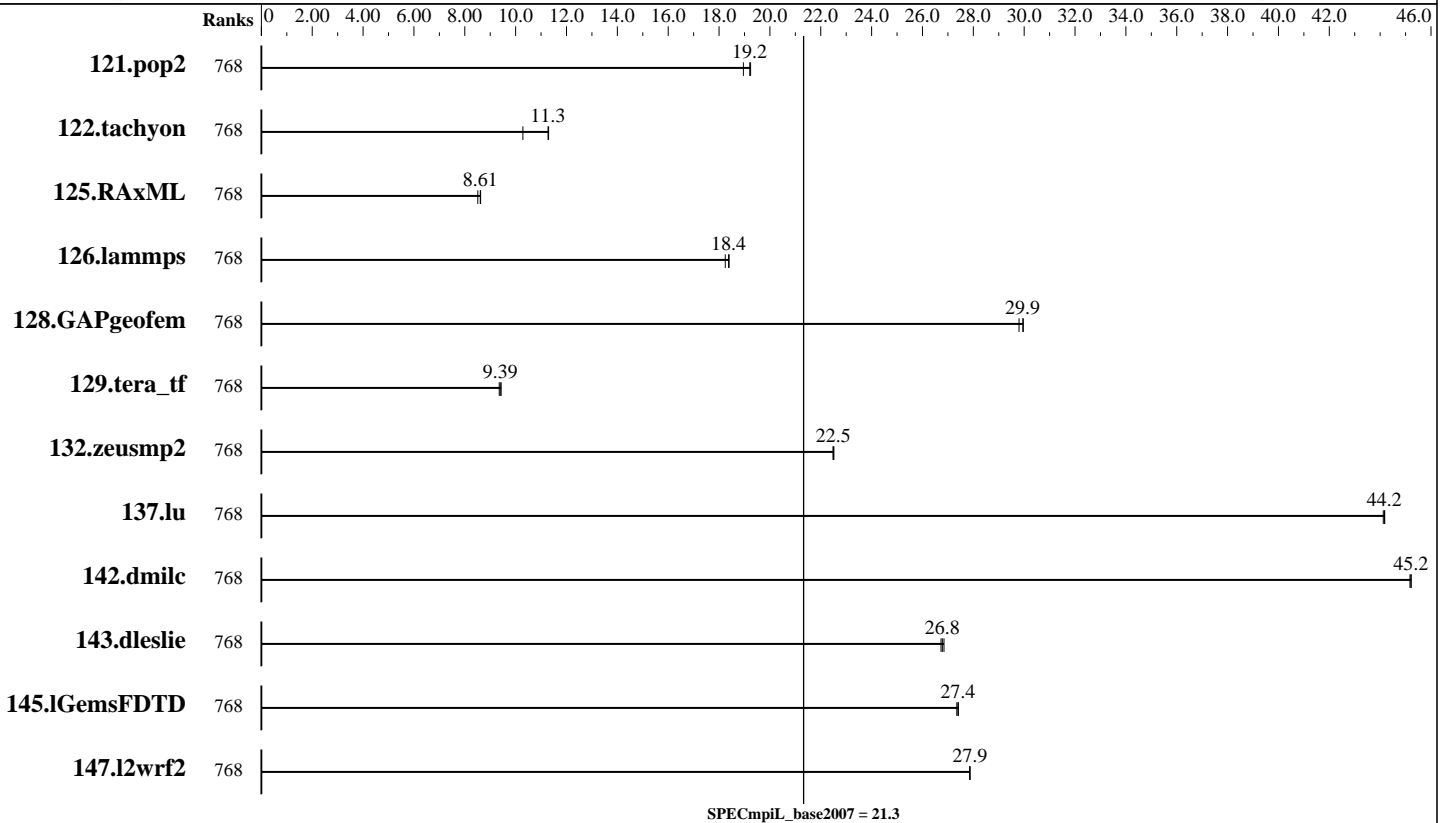
Test sponsor: SGI

Tested by: SGI

Test date: Apr-2010

Hardware Availability: May-2010

Software Availability: Feb-2010



## Results Table

Benchmark	Base							Peak						
	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
121.pop2	768	205	19.0	<b><u>203</u></b>	<b><u>19.2</u></b>	202	19.2							
122.tachyon	768	189	10.3	<b><u>172</u></b>	<b><u>11.3</u></b>	172	11.3							
125.RAxML	768	343	8.51	339	8.62	<b><u>339</u></b>	<b><u>8.61</u></b>							
126.lammps	768	135	18.2	<b><u>134</u></b>	<b><u>18.4</u></b>	134	18.4							
128.GAPgeofem	768	198	30.0	199	29.8	<b><u>198</u></b>	<b><u>29.9</u></b>							
129.tera_tf	768	117	9.35	<b><u>117</u></b>	<b><u>9.39</u></b>	117	9.43							
132.zeusmp2	768	94.3	22.5	<b><u>94.3</u></b>	<b><u>22.5</u></b>	94.2	22.5							
137.lu	768	95.1	44.2	<b><u>95.1</u></b>	<b><u>44.2</u></b>	95.2	44.1							
142.dmilc	768	81.5	45.2	81.6	45.2	<b><u>81.5</u></b>	<b><u>45.2</u></b>							
143.dleslie	768	116	26.7	115	26.8	<b><u>116</u></b>	<b><u>26.8</u></b>							
145.lGemsFDTD	768	161	27.4	<b><u>161</u></b>	<b><u>27.4</u></b>	161	27.3							
147.l2wrf2	768	<b><u>294</u></b>	<b><u>27.9</u></b>	294	27.9	294	27.9							

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

Standard Performance Evaluation Corporation

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### 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: 64  
 Total Chips: 128  
 Total Cores: 768  
 Total Threads: 1536  
 Total Memory: 1536 GB  
 Base Ranks Run: 768  
 Minimum Peak Ranks: --  
 Maximum Peak Ranks: --

### Software Summary

C Compiler: Intel C Compiler for Linux  
 Version 11.1, Build 20100203  
 C++ Compiler: Intel C++ Compiler for Linux  
 Version 11.1, Build 20100203  
 Fortran Compiler: Intel Fortran Compiler for Linux  
 Version 11.1, Build 20100203  
 Base Pointers: 64-bit  
 Peak Pointers: 64-bit  
 MPI Library: SGI MPT 1.26  
 Other MPI Info: OFED 1.4.1  
 Pre-processors: None  
 Other Software: None

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

### Hardware

Number of nodes: 64  
 Uses of the node: compute  
 Vendor: SGI  
 Model: SGI Altix ICE 8400EX (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 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: 1  
 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-1.4.1  
 Adapter Firmware: 2.7.0  
 Operating System: SUSE Linux Enterprise Server 10 (x86\_64) SP3  
 Kernel 2.6.16.60-0.54.5-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 6, SGI Tempo  
 V 1.10



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Software Availability: Feb-2010

### 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: 2333  
 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: 16 GB (8\*2GB DDR2-667MHz DIMMS)  
 Disk Subsystem: 4.3 TB RAID 5  
 48 x 146 GB SAS (Seagate Cheetah 15K.5)  
 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 5  
 Other Software: SGI ProPack 5 for Linux Service Pack 5

### Interconnect Description: InfiniBand (MPI)

#### Hardware

Vendor: Mellanox Technologies  
 Model: MT26428 ConnectX  
 Switch Model: Mellanox MT48436 InfiniScale-IV  
 Number of Switches: 128  
 Number of Ports: 36  
 Data Rate: InfiniBand 4x QDR  
 Firmware: 5030004  
 Topology: Bristle hypercube  
 Primary Use: MPI traffic

#### Software



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Hardware Availability: May-2010

Software Availability: Feb-2010

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

#### Hardware

Vendor: Mellanox Technologies  
 Model: MT26428 ConnectX  
 Switch Model: Mellanox MT48436 InfiniScale-IV  
 Number of Switches: 64  
 Number of Ports: 36  
 Data Rate: InfiniBand 4x QDR  
 Firmware: 5030004  
 Topology: Bristle hypercube  
 Primary Use: I/O traffic

#### Software

### 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_DSM_DISTRIBUTE=yes
export MPI_IB_RAILS=2
ulimit -s unlimited
```

#### BIOS settings:

```
AMI BIOS version 8.16
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, 16 switches for 768 ranks, 32 switches for 1536 ranks, 64 switches for 3072 ranks.

### Base Compiler Invocation

#### C benchmarks:

icc

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## Base Compiler Invocation (Continued)

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

## 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\\_Intel1111\\_flags.20100202.html](http://www.spec.org/mpi2007/flags/SGI_x86_64_Intel1111_flags.20100202.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.20100202.xml](http://www.spec.org/mpi2007/flags/SGI_x86_64_Intel1111_flags.20100202.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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