



# SPEC<sup>®</sup> MPIL2007 Result

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## SGI

SGI Altix ICE 8200EX  
(Intel Xeon X5560, 2.80 GHz)

SPECmpiL\_peak2007 = Not Run

SPECmpiL\_base2007 = 27.9

MPI2007 license: 4

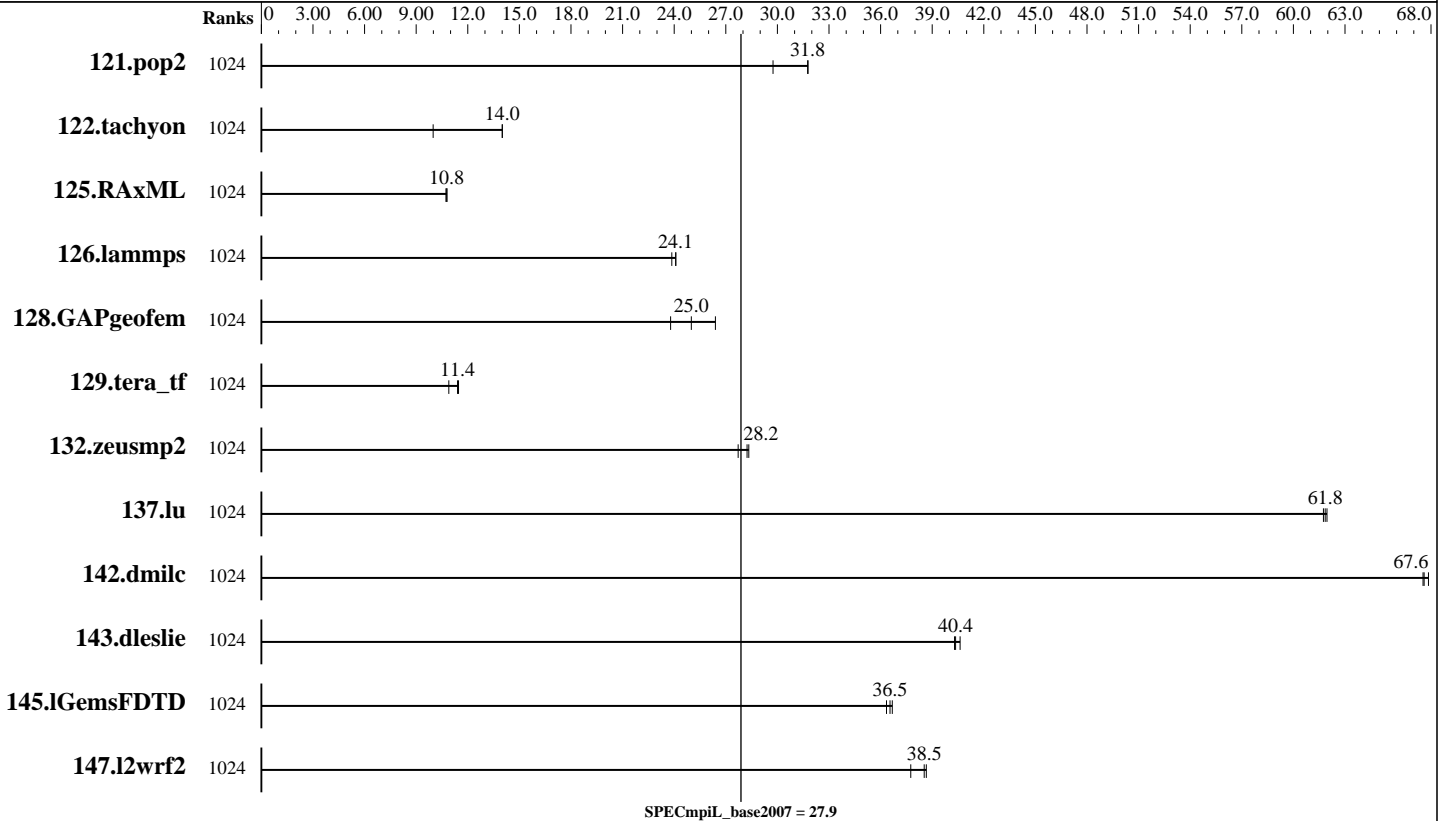
Test sponsor: SGI

Tested by: SGI

Test date: Jan-2010

Hardware Availability: Sep-2009

Software Availability: Dec-2009



## Results Table

Benchmark	Base								Peak							
	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio		
121.pop2	1024	131	29.7	122	31.8	<b><u>123</u></b>	<b><u>31.8</u></b>									
122.tachyon	1024	195	9.99	<b><u>139</u></b>	<b><u>14.0</u></b>	139	14.0									
125.RAxML	1024	272	10.7	271	10.8	<b><u>271</u></b>	<b><u>10.8</u></b>									
126.lammps	1024	103	23.9	<b><u>102</u></b>	<b><u>24.1</u></b>	102	24.1									
128.GAPgeofem	1024	225	26.4	<b><u>237</u></b>	<b><u>25.0</u></b>	249	23.8									
129.tera_tf	1024	101	10.9	95.9	11.5	<b><u>96.4</u></b>	<b><u>11.4</u></b>									
132.zeusmp2	1024	<b><u>75.1</u></b>	<b><u>28.2</u></b>	74.8	28.3	76.5	27.7									
137.lu	1024	68.1	61.7	<b><u>67.9</u></b>	<b><u>61.8</u></b>	67.8	62.0									
142.dmilc	1024	54.5	67.5	<b><u>54.5</u></b>	<b><u>67.6</u></b>	54.3	67.9									
143.dleslie	1024	<b><u>76.8</u></b>	<b><u>40.4</u></b>	76.9	40.3	76.3	40.6									
145.lGemsFDTD	1024	<b><u>121</u></b>	<b><u>36.5</u></b>	121	36.3	120	36.7									
147.l2wrf2	1024	<b><u>213</u></b>	<b><u>38.5</u></b>	217	37.8	212	38.7									

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 8200EX Compute Node  
 Interconnects: InfiniBand (MPI)  
 InfiniBand (I/O)  
 File Server Node: SGI InfiniteStorage Nexis 2000 NAS  
 Total Compute Nodes: 128  
 Total Chips: 256  
 Total Cores: 1024  
 Total Threads: 2048  
 Total Memory: 4608 GB  
 Base Ranks Run: 1024  
 Minimum Peak Ranks: --  
 Maximum Peak Ranks: --

### Software Summary

C Compiler: Intel C Compiler for Linux  
 Version 11.1, Build 20091130  
 C++ Compiler: Intel C++ Compiler for Linux  
 Version 11.1, Build 20091130  
 Fortran Compiler: Intel Fortran Compiler for Linux  
 Version 11.1, Build 20091130  
 Base Pointers: 64-bit  
 Peak Pointers: 64-bit  
 MPI Library: SGI MPT 1.25  
 Other MPI Info: OFED-1.4.1  
 Pre-processors: None  
 Other Software: None

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

### Hardware

Number of nodes: 128  
 Uses of the node: compute  
 Vendor: SGI  
 Model: SGI Altix ICE 8200EX (Intel Xeon X5560, 2.80 GHz)  
 CPU Name: Intel Xeon X5560  
 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 3.2 GHz,  
 6.4 GT/s QPI, Hyper-Threading enabled  
 CPU MHz: 2800  
 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: 36 GB (6\*4GB + 6\*2GB DDR3-1333 CL9 RDIMMs running  
 at 1066 MHz. The 4GB DIMM is installed in DIMM  
 slot A in each channel.)  
 Disk Subsystem: None  
 Other Hardware: None  
 Adapter: Mellanox MT26418 ConnectX IB DDR  
 (PCIe x8 Gen2 5 GT/s)  
 Number of Adapters: 1  
 Slot Type: PCIe x8 Gen2  
 Data Rate: InfiniBand 4x DDR  
 Ports Used: 2  
 Interconnect Type: InfiniBand

### Software

Adapter: Mellanox MT26418 ConnectX IB DDR  
 (PCIe x8 Gen2 5 GT/s)  
 Adapter Driver: OFED-1.4.1  
 Adapter Firmware: 2.6.0  
 Operating System: SUSE Linux Enterprise Server 10 (x86\_64) SP2  
 Kernel 2.6.16.60-0.30-smp  
 Local File System: None  
 Shared File System: NFSv3 IPoIB  
 System State: Multi-user, run level 3  
 Other Software: SGI ProPack 6 for Linux Service Pack 5, SGI Tempo  
 V 1.9



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Hardware Availability: Sep-2009

Software Availability: Dec-2009

### 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 MT26418 ConnectX IB DDR  
 (PCIe x8 Gen2 5 GT/s)  
 Number of Adapters: 2  
 Slot Type: PCIe x8 Gen2  
 Data Rate: InfiniBand 4x DDR  
 Ports Used: 2  
 Interconnect Type: InfiniBand

#### Software

Adapter: Mellanox MT26418 ConnectX IB DDR  
 (PCIe x8 Gen2 5 GT/s)  
 Adapter Driver: OFED-1.4.1  
 Adapter Firmware: 2.3.0  
 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 MT48436 InfiniScale-IV  
 Number of Switches: 128  
 Number of Ports: 36  
 Data Rate: InfiniBand 4x QDR  
 Firmware: 4020001  
 Topology: Bristle hypercube with double dimensional links  
 Primary Use: MPI traffic

#### Software



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Software Availability: Dec-2009

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

Hardware		Software
Vendor:	Mellanox Technologies	
Model:	MT26418 ConnectX	
Switch Model:	Mellanox MT48436 InfiniScale-IV	
Number of Switches:	64	
Number of Ports:	36	
Data Rate:	InfiniBand 4x QDR	
Firmware:	4020001	
Topology:	Bristle hypercube with double dimensional links	
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_DSM_DISTRIBUTE=yes
export MPI_IB_RAILS=2
ulimit -s unlimited
```

#### 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
```

#### Interconnect Data Rate:

The system interconnect has DDR InfiniBand HCAs, while the switches and cables run up to QDR rate.

#### 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 16/32/64 ranks, 4 switches for 128 ranks, 8 switches for 256 ranks, 16 switches for 512 ranks, 32 switches for 1024 ranks, 64 switches for 2048 ranks and 128 switches for 4096 ranks.



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## 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

## 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

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## Base Other Flags (Continued)

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.20100202.html](http://www.spec.org/mpi2007/flags/SGI_x86_64_Intel111_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\\_Intel111\\_flags.20100202.xml](http://www.spec.org/mpi2007/flags/SGI_x86_64_Intel111_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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