



# SPEC® MPIL2007 Result

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## SGI

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

SPECmpiL\_peak2007 = Not Run

SPECmpiL\_base2007 = 3.26

MPI2007 license: 4

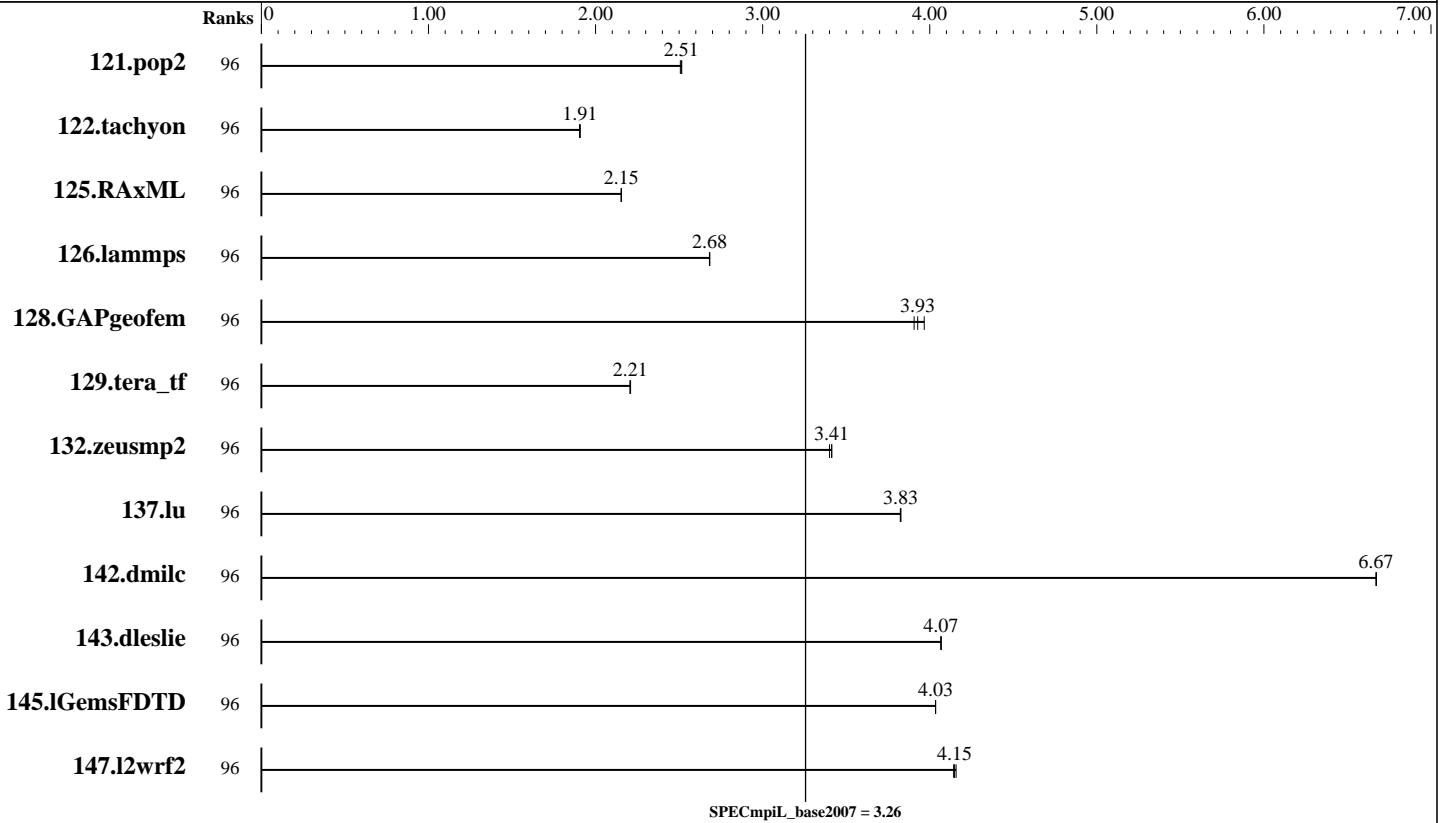
Test sponsor: SGI

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
121.pop2	96	<u>1548</u>	<u>2.51</u>	1552	2.51	1547	2.52							
122.tachyon	96	1021	1.90	1019	1.91	<u>1020</u>	<u>1.91</u>							
125.RAxML	96	<u>1355</u>	<u>2.15</u>	1356	2.15	1355	2.15							
126.lammps	96	<u>917</u>	<u>2.68</u>	917	2.68	916	2.68							
128.GAPgeofem	96	1519	3.91	<u>1511</u>	<u>3.93</u>	1496	3.97							
129.tera_tf	96	498	2.21	<u>498</u>	<u>2.21</u>	497	2.21							
132.zeusmp2	96	621	3.41	<u>621</u>	<u>3.41</u>	624	3.40							
137.lu	96	1099	3.82	<u>1098</u>	<u>3.83</u>	1098	3.83							
142.dmilc	96	552	6.67	552	6.67	<u>552</u>	<u>6.67</u>							
143.dleslie	96	762	4.07	762	4.07	<u>762</u>	<u>4.07</u>							
145.lGemsFDTD	96	<u>1093</u>	<u>4.03</u>	1093	4.03	1093	4.04							
147.l2wrf2	96	<u>1977</u>	<u>4.15</u>	1980	4.14	1973	4.16							

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

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http://www.spec.org/



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### Hardware Summary

### Software 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: --

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

### Software

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  
 Data Rate: InfiniBand 4x QDR  
 Ports Used: 1  
 Interconnect Type: InfiniBand

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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## 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  
 Firmware: 5040005  
 Topology: Enhanced Hypercube  
 Primary Use: MPI and I/O traffic

### Software



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## 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, 16 switches for 768 ranks, 32 switches for 1536 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:

126.lammps: icpc

### Fortran benchmarks:

ifort

### Benchmarks using both Fortran and C:

icc ifort



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## 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

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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