



# SPEC® MPIL2007 Result

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## SGI

SPECmpiL\_peak2007 = Not Run

SGI ICE X (Intel Xeon E5-2690 v2, 3.0 GHz)

SPECmpiL\_base2007 = 78.5

MPI2007 license: 4

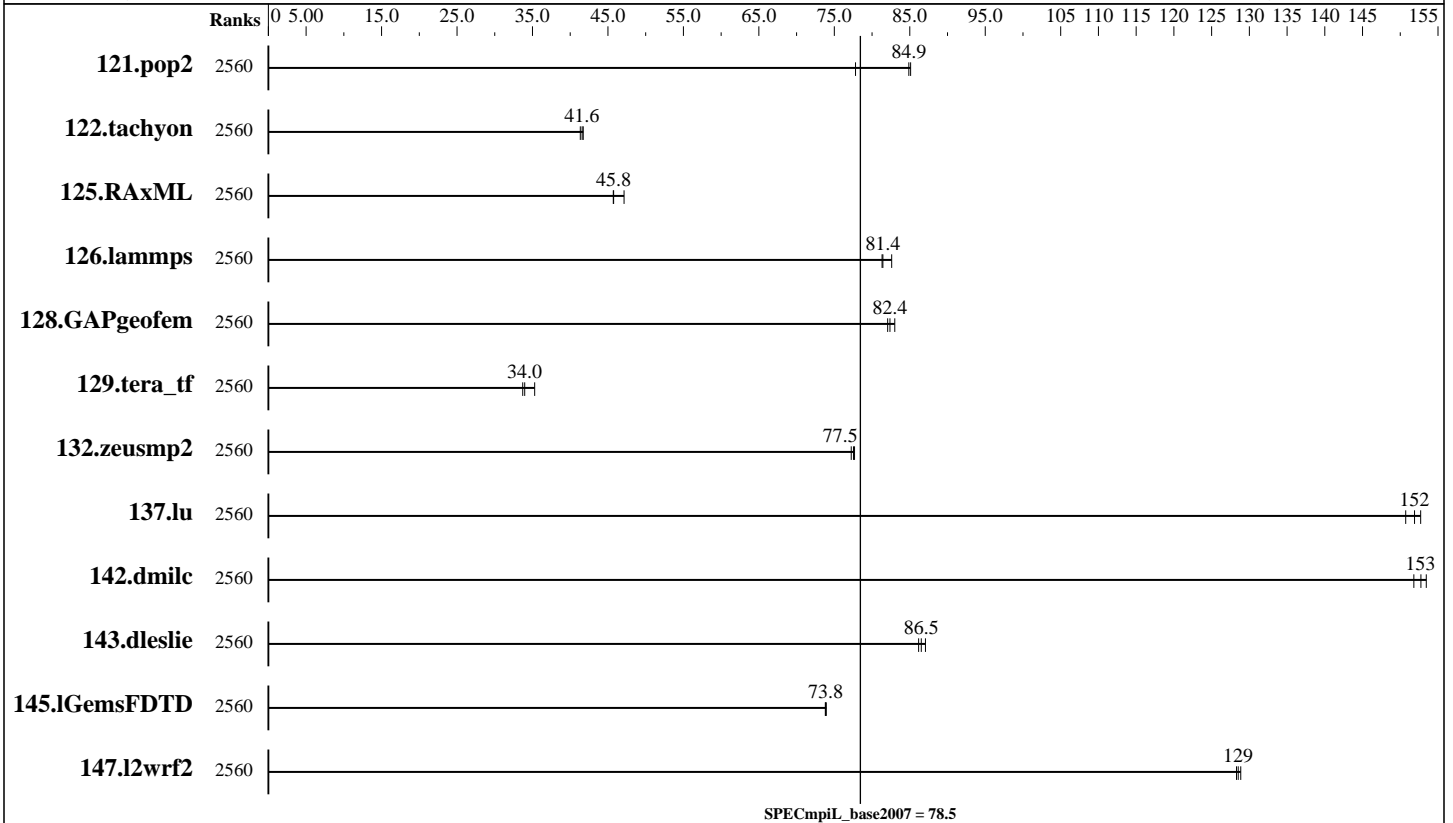
Test sponsor: SGI

Tested by: SGI

Test date: Dec-2013

Hardware Availability: Sep-2013

Software Availability: Nov-2013



## Results Table

Benchmark	Base							Peak						
	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
121.pop2	2560	50.0	77.8	45.7	85.1	<b>45.8</b>	<b>84.9</b>							
122.tachyon	2560	47.0	41.3	<b>46.8</b>	<b>41.6</b>	46.6	41.7							
125.RAxML	2560	61.9	47.1	63.9	45.7	<b>63.8</b>	<b>45.8</b>							
126.lammps	2560	30.2	81.3	29.8	82.6	<b>30.2</b>	<b>81.4</b>							
128.GAPgeofem	2560	<b>72.0</b>	<b>82.4</b>	71.5	83.0	72.3	82.1							
129.tera_tf	2560	31.1	35.3	<b>32.4</b>	<b>34.0</b>	32.6	33.7							
132.zeusmp2	2560	<b>27.3</b>	<b>77.5</b>	27.3	77.7	27.4	77.2							
137.lu	2560	27.5	153	<b>27.7</b>	<b>152</b>	27.9	151							
142.dmilc	2560	24.3	152	24.0	153	<b>24.1</b>	<b>153</b>							
143.dleslie	2560	36.0	86.2	35.6	87.1	<b>35.8</b>	<b>86.5</b>							
145.lGemsFDTD	2560	<b>59.7</b>	<b>73.8</b>	59.7	73.9	59.8	73.8							
147.l2wrf2	2560	63.7	129	63.9	128	<b>63.8</b>	<b>129</b>							

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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http://www.spec.org/



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### Hardware Summary

Type of System: Homogeneous  
 Compute Node: SGI ICE X IP-113 Compute Node  
 Interconnect: InfiniBand (MPI and I/O)  
 File Server Node: SGI Modular InfiniteStorage Server  
 Total Compute Nodes: 128  
 Total Chips: 256  
 Total Cores: 2560  
 Total Threads: 5120  
 Total Memory: 8 TB  
 Base Ranks Run: 2560  
 Minimum Peak Ranks: --  
 Maximum Peak Ranks: --

### Software Summary

C Compiler: Intel C++ Composer XE 2011 for Linux, Version 14.0.0.080 Build 20130728  
 C++ Compiler: Intel C++ Composer XE 2011 for Linux, Version 14.0.0.080 Build 20130728  
 Fortran Compiler: Intel Fortran Composer XE 2011 for Linux, Version 14.0.0.080 Build 20130728  
 Base Pointers: 64-bit  
 Peak Pointers: 64-bit  
 MPI Library: SGI MPT 2.09  
 Other MPI Info: OFED 1.5.2  
 Pre-processors: None  
 Other Software: None

## Node Description: SGI ICE X IP-113 Compute Node

### Hardware

Number of nodes: 128  
 Uses of the node: compute  
 Vendor: SGI  
 Model: SGI ICE X IP-113 (Intel Xeon E5-2690 v2, 3.0 GHz)  
 CPU Name: Intel Xeon E5-2690 v2  
 CPU(s) orderable: 1-2 chips  
 Chips enabled: 2  
 Cores enabled: 20  
 Cores per chip: 10  
 Threads per core: 2  
 CPU Characteristics: Ten Core, 3.0 GHz, 8.0 GT/s QPI  
 Intel Turbo Boost Technology up to 3.60 GHz  
 Hyper-Threading Technology enabled  
 CPU MHz: 3000  
 Primary Cache: 32 KB I + 32 KB D on chip per core  
 Secondary Cache: 256 KB I+D on chip per core  
 L3 Cache: 25 MB I+D on chip per chip  
 Other Cache: None  
 Memory: 64 GB (8 x 8 GB 2Rx4 PC3-14900R-13, ECC)  
 Disk Subsystem: None  
 Other Hardware: None  
 Adapter: Mellanox MT27500 with ConnectX-3 ASIC (PCIe x8 Gen3 8 GT/s)  
 Number of Adapters: 2  
 Slot Type: PCIe x8 Gen3  
 Data Rate: InfiniBand 4x FDR  
 Ports Used: 2  
 Interconnect Type: InfiniBand

### Software

Adapter: Mellanox MT27500 with ConnectX-3 ASIC (PCIe x8 Gen3 8 GT/s)  
 Adapter Driver: OFED-1.5.2  
 Adapter Firmware: 2.11.312  
 Operating System: SUSE Linux Enterprise Server 11 SP2, Kernel 3.0.80-0.7-default  
 Local File System: NFSv3  
 Shared File System: NFSv3 IPoIB  
 System State: Multi-user, run level 3  
 Other Software: SGI Tempo Compute Node 2.7.3, Build 708rp14.sles11sp2-1305311204



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Hardware Availability: Sep-2013

Software Availability: Nov-2013

### Node Description: SGI Modular InfiniteStorage Server

#### Hardware

Number of nodes: 1  
 Uses of the node: fileserver  
 Vendor: SGI  
 Model: SGI Modular InfiniteStorage Server  
 CPU Name: Intel Xeon E5-2670  
 CPU(s) orderable: 1-2 chips  
 Chips enabled: 2  
 Cores enabled: 16  
 Cores per chip: 8  
 Threads per core: 2  
 CPU Characteristics: Intel Turbo Boost Technology up to 3.33 GHz  
 Hyper-Threading Technology enabled  
 CPU MHz: 2600  
 Primary Cache: 32 KB I + 32 KB D on chip per core  
 Secondary Cache: 256 KB I+D on chip per chip  
 L3 Cache: 20 MB I+D on chip per chip  
 Other Cache: None  
 Memory: 128 GB (8 \* 16 GB 2Rx4 PC3-12800R-11, ECC)  
 Disk Subsystem: 64.8 TB RAID 6  
 72 x 900 GB SAS (Western Digital, 10K RPM)  
 Other Hardware: None  
 Adapter: Mellanox MT27500 with ConnectX-3 ASIC  
 (PCIe x8 Gen3 8 GT/s)  
 Number of Adapters: 2  
 Slot Type: PCIe x8 Gen3  
 Data Rate: InfiniBand 4x FDR  
 Ports Used: 2  
 Interconnect Type: InfiniBand

#### Software

Adapter: Mellanox MT27500 with ConnectX-3 ASIC  
 (PCIe x8 Gen3 8 GT/s)  
 Adapter Driver: OFED-1.5.0  
 Adapter Firmware: 2.11.312  
 Operating System: SUSE Linux Enterprise Server 11 SP3  
 Kernel  
 Local File System: xfs  
 Shared File System: --  
 System State: Multi-user, run level 3  
 Other Software: SGI Foundation Software 2.9,  
 Build 700r3.sles11-1004061553

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

#### Hardware

Vendor: Mellanox Technologies and SGI  
 Model: None  
 Switch Model: SGI FDR Integrated IB Switch Blade 2SW9x27 with  
 Mellanox SwitchX device 51000  
 Number of Switches: 30  
 Number of Ports: 36  
 Data Rate: InfiniBand 4x FDR  
 Firmware: 07130007\_LL2 and 08130007\_LL2  
 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

130.socorro (base): "nullify\_ptrs" src.alt was used.

### Software environment:

```
export MPI_REQUEST_MAX=65536
export MPI_TYPE_MAX=32768
export MPI_BUFS_THRESHOLD=1
export MPI_IB_RAILS=2
export MPI_CONNECTIONS_THRESHOLD=0
ulimit -s unlimited
```

### BIOS settings:

```
AMI BIOS version 3.0
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 180 ranks, 4 switches for up to 320 ranks, 8 switches for 640 ranks, 10 switches for 800 ranks, 16 switches for 1280 ranks, 22 switches for 1920 ranks, and 30 switches for 2560 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

Continued on next page



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## Base Compiler Invocation (Continued)

Benchmarks using both Fortran and C:

icc ifort

## Base Portability Flags

121.pop2: -DSPEC\_MPI\_CASE\_FLAG

## Base Optimization Flags

C benchmarks:

-O3 -xAVX -no-prec-div

C++ benchmarks:

126.lammps: -O3 -xAVX -no-prec-div -ansi-alias

Fortran benchmarks:

-O3 -xAVX -no-prec-div

Benchmarks using both Fortran and C:

-O3 -xAVX -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\\_Intel14\\_flags.html](http://www.spec.org/mpi2007/flags/SGI_x86_64_Intel14_flags.html)

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

[http://www.spec.org/mpi2007/flags/SGI\\_x86\\_64\\_Intel14\\_flags.xml](http://www.spec.org/mpi2007/flags/SGI_x86_64_Intel14_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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