



# SPEC<sup>®</sup> MPIM2007 Result

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## SGI

SPECmpiM\_peak2007 = Not Run

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

SPECmpiM\_base2007 = 67.5

MPI2007 license: 4

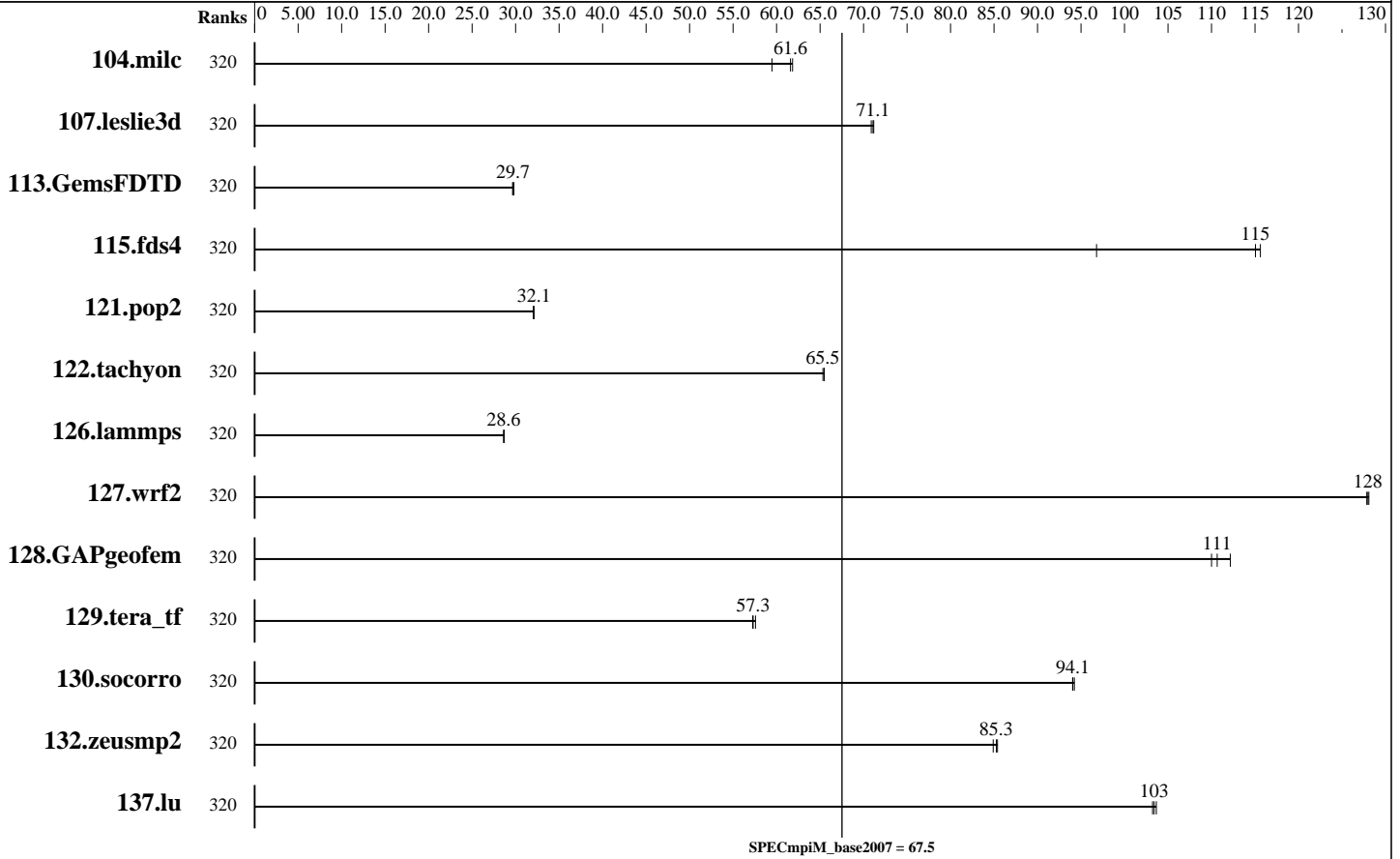
Test sponsor: SGI

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		
104.milc	320	26.3	59.5	<b><u>25.4</u></b>	<b><u>61.6</u></b>	25.3	61.8									
107.leslie3d	320	73.6	70.9	73.3	71.2	<b><u>73.4</u></b>	<b><u>71.1</u></b>									
113.GemsFDTD	320	<b><u>212</u></b>	<b><u>29.7</u></b>	213	29.7	212	29.8									
115.fds4	320	16.9	116	<b><u>17.0</u></b>	<b><u>115</u></b>	20.2	96.8									
121.pop2	320	<b><u>129</u></b>	<b><u>32.1</u></b>	129	32.0	129	32.1									
122.tachyon	320	42.8	65.3	42.7	65.5	<b><u>42.7</u></b>	<b><u>65.5</u></b>									
126.lammps	320	102	28.6	<b><u>102</u></b>	<b><u>28.6</u></b>	102	28.7									
127.wrf2	320	<b><u>60.9</u></b>	<b><u>128</u></b>	60.9	128	61.0	128									
128.GAPgeofem	320	18.4	112	18.8	110	<b><u>18.7</u></b>	<b><u>111</u></b>									
129.tera_tf	320	48.1	57.6	48.3	57.2	<b><u>48.3</u></b>	<b><u>57.3</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	320	<u>40.6</u>	<u>94.1</u>	40.6	94.0	40.5	94.2							
132.zeusmp2	320	<u>36.4</u>	<u>85.3</u>	36.3	85.4	36.5	84.9							
137.lu	320	35.6	103	<u>35.5</u>	<u>103</u>	35.5	104							

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 ICE X IP-113 Compute Node  
 Interconnect: InfiniBand (MPI and I/O)  
 File Server Node: SGI Modular InfiniteStorage Server  
 Total Compute Nodes: 16  
 Total Chips: 32  
 Total Cores: 320  
 Total Threads: 640  
 Total Memory: 1 TB  
 Base Ranks Run: 320  
 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: 16  
 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

### 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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Tested by: SGI

Test date: Dec-2013

Hardware Availability: Sep-2013

Software Availability: Nov-2013

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

Data Rate: InfiniBand 4x FDR  
Ports Used: 2  
Interconnect Type: InfiniBand

### 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: 4  
Number of Ports: 36  
Data Rate: InfiniBand 4x FDR

#### Software

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Software Availability: Nov-2013

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

Firmware: 07130007\_LL2 and 08130007\_LL2  
Topology: Enhanced Hypercube  
Primary Use: MPI and I/O traffic

### 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
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

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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

127.wrf2: -DSPEC\_MPI\_CASE\_FLAG -DSPEC\_MPI\_LINUX

130.socorro: -assume nostd\_intent\_in

## 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

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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\\_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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