



# SPEC® MPIM2007 Result

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## SGI

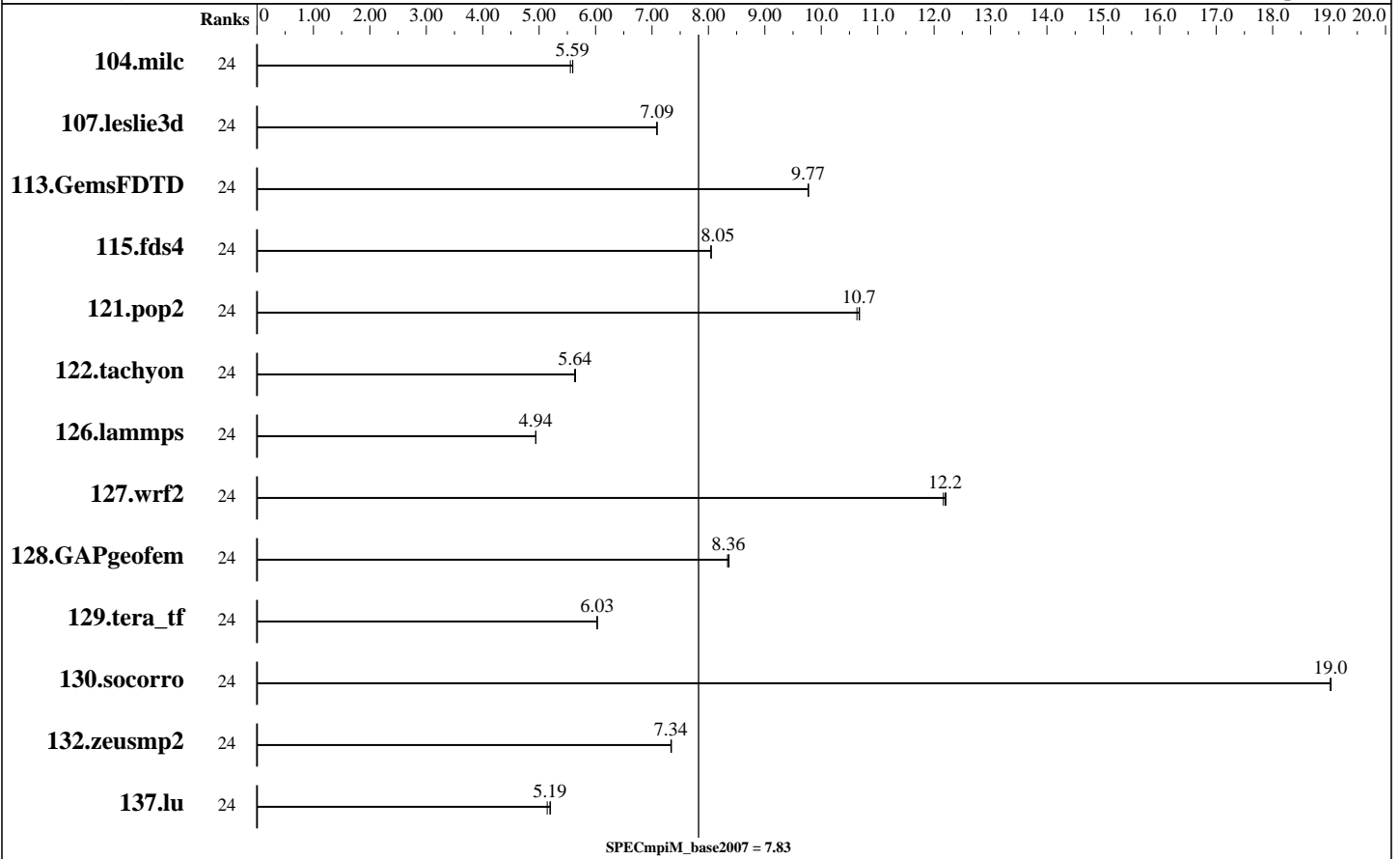
SGI ICE X  
(Intel Xeon E5-2690 v3, 2.6 GHz)

SPECmpiM\_peak2007 = Not Run

SPECmpiM\_base2007 = 7.83

MPI2007 license: 14  
Test sponsor: SGI  
Tested by: SGI

Test date: Jul-2014  
Hardware Availability: Sep-2014  
Software Availability: Apr-2014



## Results Table

Benchmark	Base								Peak							
	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio		
104.milc	24	282	5.55	<b><u>280</u></b>	<b><u>5.59</u></b>	280	5.60									
107.leslie3d	24	<b><u>737</u></b>	<b><u>7.09</u></b>	736	7.09	737	7.09									
113.GemsFDTD	24	646	9.77	645	9.77	<b><u>646</u></b>	<b><u>9.77</u></b>									
115.fds4	24	242	8.05	<b><u>242</u></b>	<b><u>8.05</u></b>	243	8.05									
121.pop2	24	388	10.6	<b><u>387</u></b>	<b><u>10.7</u></b>	387	10.7									
122.tachyon	24	497	5.63	496	5.64	<b><u>496</u></b>	<b><u>5.64</u></b>									
126.lammps	24	<b><u>590</u></b>	<b><u>4.94</u></b>	590	4.94	590	4.94									
127.wrf2	24	641	12.2	639	12.2	<b><u>639</u></b>	<b><u>12.2</u></b>									
128.GAPgeofem	24	<b><u>247</u></b>	<b><u>8.36</u></b>	247	8.37	248	8.34									
129.tera_tf	24	459	6.03	<b><u>459</u></b>	<b><u>6.03</u></b>	459	6.03									

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	24	201	19.0	201	19.0	<u>201</u>	<u>19.0</u>									
132.zeusmp2	24	423	7.34	<u>423</u>	<u>7.34</u>	422	7.35									
137.lu	24	<u>708</u>	<u>5.19</u>	707	5.20	715	5.14									

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-131 Compute Node  
 Interconnect: InfiniBand (MPI and I/O)  
 File Server Node: SGI Rackable C1103-TY12  
 Total Compute Nodes: 1  
 Total Chips: 2  
 Total Cores: 24  
 Total Threads: 24  
 Total Memory: 128 GB  
 Base Ranks Run: 24  
 Minimum Peak Ranks: --  
 Maximum Peak Ranks: --

#### Software Summary

C Compiler: Intel C++ Composer XE 2013 for Linux, Version 14.0.3.174 Build 20140422  
 C++ Compiler: Intel C++ Composer XE 2013 for Linux, Version 14.0.3.174 Build 20140422  
 Fortran Compiler: Intel Fortran Composer XE 2013 for Linux, Version 14.0.3.174 Build 20140422  
 Base Pointers: 64-bit  
 Peak Pointers: Not Applicable  
 MPI Library: SGI MPT 2.09 Patch 11049  
 Other MPI Info: OFED 1.5.4  
 Pre-processors: None  
 Other Software: None

### Node Description: SGI ICE X IP-131 Compute Node

#### Hardware

Number of nodes: 1  
 Uses of the node: compute  
 Vendor: SGI  
 Model: SGI ICE X (Intel Xeon E5-2690 v3, 2.6 GHz)  
 CPU Name: Intel Xeon E5-2690 v3  
 CPU(s) orderable: 1-2 chips  
 Chips enabled: 2  
 Cores enabled: 24  
 Cores per chip: 12  
 Threads per core: 1  
 CPU Characteristics: 12 Core, 2.60 GHz, 9.6 GT/s QPI  
 Intel Turbo Boost Technology up to 3.50 GHz  
 Hyper-Threading Technology disabled  
 CPU MHz: 2600  
 Primary Cache: 32 KB I + 32 KB D on chip per core  
 Secondary Cache: 256 KB I+D on chip per core  
 L3 Cache: 30 MB I+D on chip per chip  
 Other Cache: None  
 Memory: 128 GB (8 x 16 GB 2Rx4 PC4-17000R-15, 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-1.5.4  
 Adapter Firmware: 2.30.3000  
 Operating System: SUSE Linux Enterprise Server 11 SP3 (x86\_64), Kernel 3.0.93-0.8-default  
 Local File System: NFSv3  
 Shared File System: NFSv3 IPoIB  
 System State: Multi-user, run level 3  
 Other Software: SGI Tempo Service Node 2.8.1, Build 709rp49.sles11sp3-1402182002

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Software Availability: Apr-2014

### Node Description: SGI ICE X IP-131 Compute Node

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

### Node Description: SGI Rackable C1103-TY12

#### Hardware

Number of nodes: 1  
Uses of the node: fileserver  
Vendor: SGI  
Model: SGI Rackable C1103-TY12 (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 2Rx4 PC3-10600R-9, ECC)  
Disk Subsystem: 12 TB RAID 6  
12 x 1 TB SATA (Seagate Constellation, 7200RPM)  
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: 2.30.3000  
Operating System: SUSE Linux Enterprise Server 11 SP1 (x86\_64), Kernel 2.6.32.46-0.3-default  
Local File System: xfs  
Shared File System: --  
System State: Multi-user, run level 3  
Other Software: SGI Foundation Software 2.5, Build 705r10.sles11-1110192111

### 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: 2  
Number of Ports: 36  
Data Rate: InfiniBand 4x FDR

#### Software

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Software Availability: Apr-2014

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

Firmware: 09.02.3000  
Topology: Enhanced Hypercube  
Primary Use: MPI and 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_IB_RAILS=2
ulimit -s unlimited
```

### BIOS settings:

```
AMI BIOS version DY2E6044
Hyper-Threading Technology disabled
Intel Turbo Boost Technology enabled (default)
Intel Turbo Boost Technology activated with
modprobe acpi_cpufreq
cpupower frequency-set -u 2601MHz -d 2601MHz -g performance
```

### 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 192 ranks, 4 switches for up to 384 ranks, 8 switches for 768 ranks, and 16 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

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## Base Compiler Invocation (Continued)

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 -xCORE-AVX2 -no-prec-div

C++ benchmarks:

126.lammps: -O3 -xCORE-AVX2 -no-prec-div -ansi-alias

Fortran benchmarks:

-O3 -xCORE-AVX2 -no-prec-div

Benchmarks using both Fortran and C:

-O3 -xCORE-AVX2 -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\\_Intel14\\_flags.20140908.html](http://www.spec.org/mpi2007/flags/SGI_x86_64_Intel14_flags.20140908.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.20140908.xml](http://www.spec.org/mpi2007/flags/SGI_x86_64_Intel14_flags.20140908.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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