



SPEC® MPIM2007 Result

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SGI

SGI Rackable C2112-4RP4
(Intel Xeon E5-2697 v2, 2.70 GHz)

SPECmpim_peak2007 = 87.4

SPECmpim_base2007 = 84.1

MPI2007 license: 4

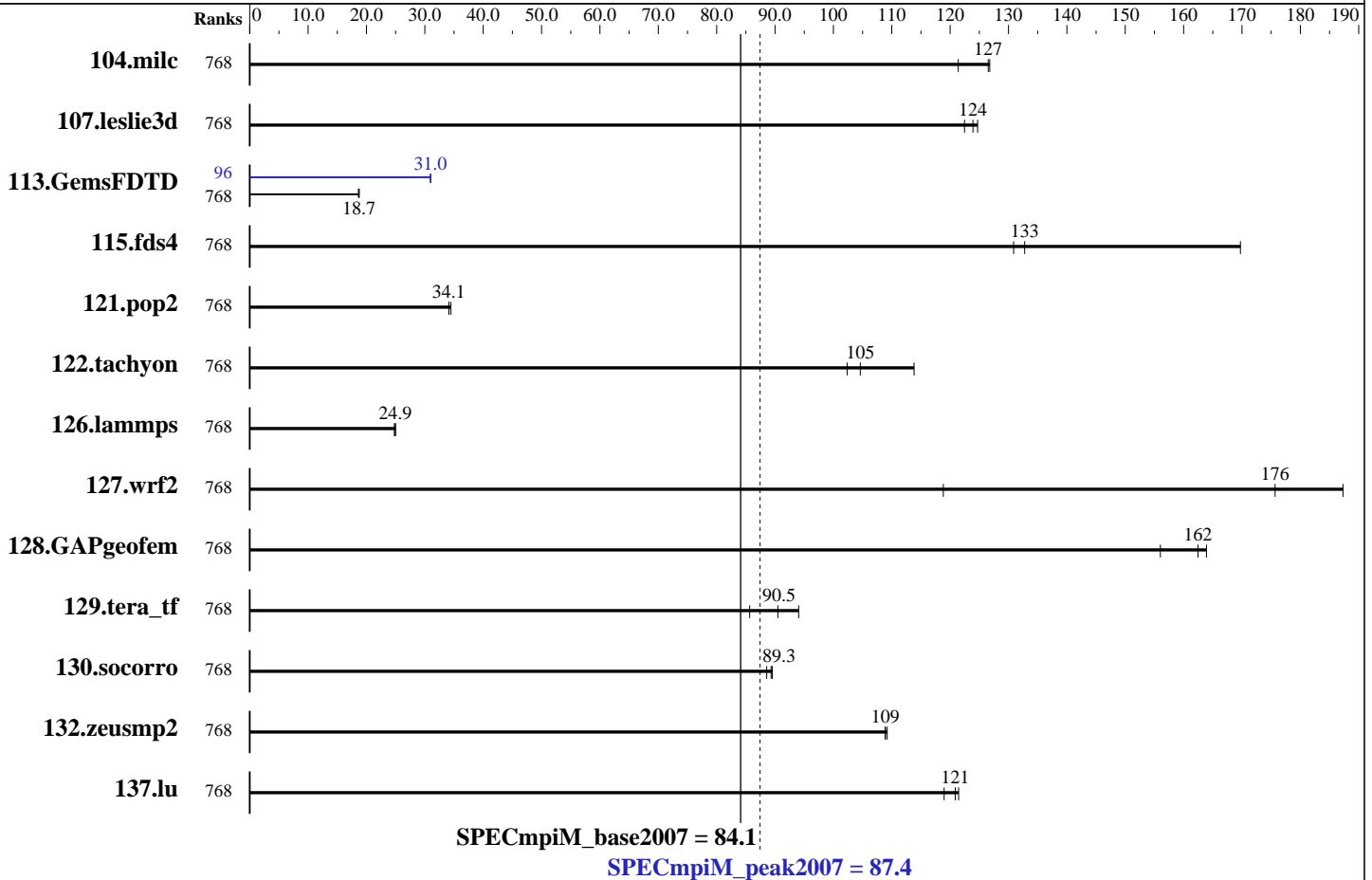
Test sponsor: SGI

Tested by: SGI

Test date: Aug-2013

Hardware Availability: Sep-2013

Software Availability: Jun-2013



Results Table

Benchmark	Base								Peak							
	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio		
104.milc	768	12.9	121	12.3	127	<u>12.4</u>	<u>127</u>	768	12.9	121	12.3	127	<u>12.4</u>	<u>127</u>		
107.leslie3d	768	<u>42.1</u>	<u>124</u>	42.6	122	41.9	125	768	<u>42.1</u>	<u>124</u>	42.6	122	41.9	125		
113.GemsFDTD	768	339	18.6	<u>337</u>	<u>18.7</u>	337	18.7	96	203	31.0	204	31.0	<u>204</u>	<u>31.0</u>		
115.fds4	768	11.5	170	<u>14.7</u>	<u>133</u>	14.9	131	768	11.5	170	<u>14.7</u>	<u>133</u>	14.9	131		
121.pop2	768	<u>121</u>	<u>34.1</u>	121	34.1	120	34.5	768	<u>121</u>	<u>34.1</u>	121	34.1	120	34.5		
122.tachyon	768	27.3	102	24.6	114	<u>26.7</u>	<u>105</u>	768	27.3	102	24.6	114	<u>26.7</u>	<u>105</u>		
126.lammps	768	118	24.8	<u>117</u>	<u>24.9</u>	117	25.0	768	118	24.8	<u>117</u>	<u>24.9</u>	117	25.0		
127.wrf2	768	41.6	187	65.6	119	<u>44.4</u>	<u>176</u>	768	41.6	187	65.6	119	<u>44.4</u>	<u>176</u>		
128.GAPgeofem	768	12.6	164	13.2	156	<u>12.7</u>	<u>162</u>	768	12.6	164	13.2	156	<u>12.7</u>	<u>162</u>		
129.tera_tf	768	32.3	85.7	29.4	94.0	<u>30.6</u>	<u>90.5</u>	768	32.3	85.7	29.4	94.0	<u>30.6</u>	<u>90.5</u>		

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	768	42.6	89.5	43.1	88.6	42.7	89.3	768	42.6	89.5	43.1	88.6	42.7	89.3
132.zeusmp2	768	28.5	109	28.5	109	28.4	109	768	28.5	109	28.5	109	28.4	109
137.lu	768	30.9	119	30.4	121	30.3	121	768	30.9	119	30.4	121	30.3	121

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 Rackable C2112-4RP4 Compute Node
 Interconnect: InfiniBand (MPI and I/O)
 File Server Node: SGI MIS Server
 Total Compute Nodes: 32
 Total Chips: 64
 Total Cores: 768
 Total Threads: 1536
 Total Memory: 4 TB
 Base Ranks Run: 768
 Minimum Peak Ranks: 96
 Maximum Peak Ranks: 768

Software Summary

C Compiler: Intel C++ Composer XE 2013 for Linux, Version 14.0.0.051 Build 20130529
 C++ Compiler: Intel C++ Composer XE 2013 for Linux, Version 14.0.0.051 Build 20130529
 Fortran Compiler: Intel Fortran Composer XE 2013 for Linux, Version 14.0.0.051 Build 20130529
 Base Pointers: 64-bit
 Peak Pointers: 64-bit
 MPI Library: SGI MPT 2.08 Patch 11012
 Other MPI Info: OFED 1.5.2
 Pre-processors: None
 Other Software: None

Node Description: SGI Rackable C2112-4RP4 Compute Node

Hardware

Number of nodes: 32
 Uses of the node: compute
 Vendor: SGI
 Model: SGI Rackable C2112-4RP4 (Intel Xeon E5-2697 v2, 2.70GHz)
 CPU Name: Intel Xeon E5-2697 v2
 CPU(s) orderable: 1-2 chips
 Chips enabled: 2
 Cores enabled: 24
 Cores per chip: 12
 Threads per core: 2
 CPU Characteristics: Twelve Core, 2.7 GHz, 8.0 GT/s QPI Intel Turbo Boost Technology up to 3.5 GHz Hyper-Threading Technology enabled
 CPU MHz: 2700
 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, 30 MB shared / 12 cores
 Other Cache: None
 Memory: 128 GB (8 x 16 GB 2Rx4 PC3-14900R-13, ECC)
 Disk Subsystem: None
 Other Hardware: None
 Adapter: Mellanox MT27500 with ConnectX-3 ASIC (PCIe x8 Gen3 8.0 GT/s)

Software

Adapter: Mellanox MT27500 with ConnectX-3 ASIC (PCIe x8 Gen3 8.0 GT/s)
 Adapter Driver: OFED-1.5.2
 Adapter Firmware: 2.10.2370
 Operating System: SUSE Linux Enterprise Server 11 SP2, Kernel 3.0.74-0.6.6-default
 Local File System: xfs
 Shared File System: NFSv3 IPoIB
 System State: Multi-user, run level 3
 Other Software: SGI Accelerate 1.6, Build 708r14.sles11sp2-1304102205

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Software Availability: Jun-2013

Node Description: SGI Rackable C2112-4RP4 Compute Node

Number of Adapters: 2
Slot Type: PCIe x8 Gen3
Data Rate: InfiniBand 4x FDR
Ports Used: 1
Interconnect Type: InfiniBand

Node Description: SGI MIS Server

Hardware

Number of nodes: 1
Uses of the node: fileserver
Vendor: SGI
Model: SGI MIS Server (Intel Xeon X2670, 2.60 GHz)
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 12800R-11, ECC)
Disk Subsystem: 57.6 TB RAID6
64 x 900 GB SAS (Western Digital WD9001BKHG 10K)
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: 2.11.500
Operating System: SUSE Linux Enterprise Server 11 SP2 (x86_64)
Kernel 3.0.74-0.6.6-default
Local File System: xfs
Shared File System: --
System State: Multi-user, run level 3
Other Software: SGI Foundation Software 2.8,
Build 708r14.sles11sp2-1304102205

Interconnect Description: InfiniBand (MPI and I/O)

Hardware

Vendor: Mellanox Technologies
Model: None
Switch Model: Mellanox SX6025 InfiniBand Switch
Number of Switches: 4
Number of Ports: 36

Software

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Interconnect Description: InfiniBand (MPI and I/O)

Data Rate:	InfiniBand 4x FDR
Firmware:	9.1.7000
Switch Model:	Mellanox SX6036 InfiniBand Switch
Number of Switches:	2
Number of Ports:	36
Data Rate:	InfiniBand 4x FDR
Firmware:	9.1.6500
Topology:	Fat Tree
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
ulimit -s unlimited
```

Transparent Hugepage : disabled

```
Transparent Hugepage is disabled by
echo never > /sys/kernel/mm/transparent_hugepage/enabled
```

BIOS settings:

```
Intel BIOS version SE5C600.86B.99.99.x067.060720130951
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
```

Peak run:

In the peak run, some benchmarks used different number of ranks from base. It is the only difference between base and peak.

Compiler Invocation

C benchmarks:

icc

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Compiler Invocation (Continued)

C++ benchmarks:

126.lammps: icpc

Fortran benchmarks:

ifort

Benchmarks using both Fortran and C:

icc ifort

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

Peak Optimization Flags

C benchmarks:

104.milc: basepeak = yes

122.tachyon: basepeak = yes

C++ benchmarks:

126.lammps: basepeak = yes

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Peak Optimization Flags (Continued)

Fortran benchmarks:

107.leslie3d: basepeak = yes

113.GemsFDTD: -O3 -xAVX -no-prec-div

129.tera_tf: basepeak = yes

137.lu: basepeak = yes

Benchmarks using both Fortran and C:

115.fds4: basepeak = yes

121.pop2: basepeak = yes

127.wrf2: basepeak = yes

128.GAPgeofem: basepeak = yes

130.socorro: basepeak = yes

132.zeusmp2: basepeak = yes

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

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



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For questions about this result, please contact the tester.
For other inquiries, please contact webmaster@spec.org.

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