



SPEC® MPIM2007 Result

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SGI

SGI Altix ICE 8400EX
(Intel Xeon X5680, 3.33 GHz)

SPECmpim_peak2007 = 73.1

SPECmpim_base2007 = 69.9

MPI2007 license: 4

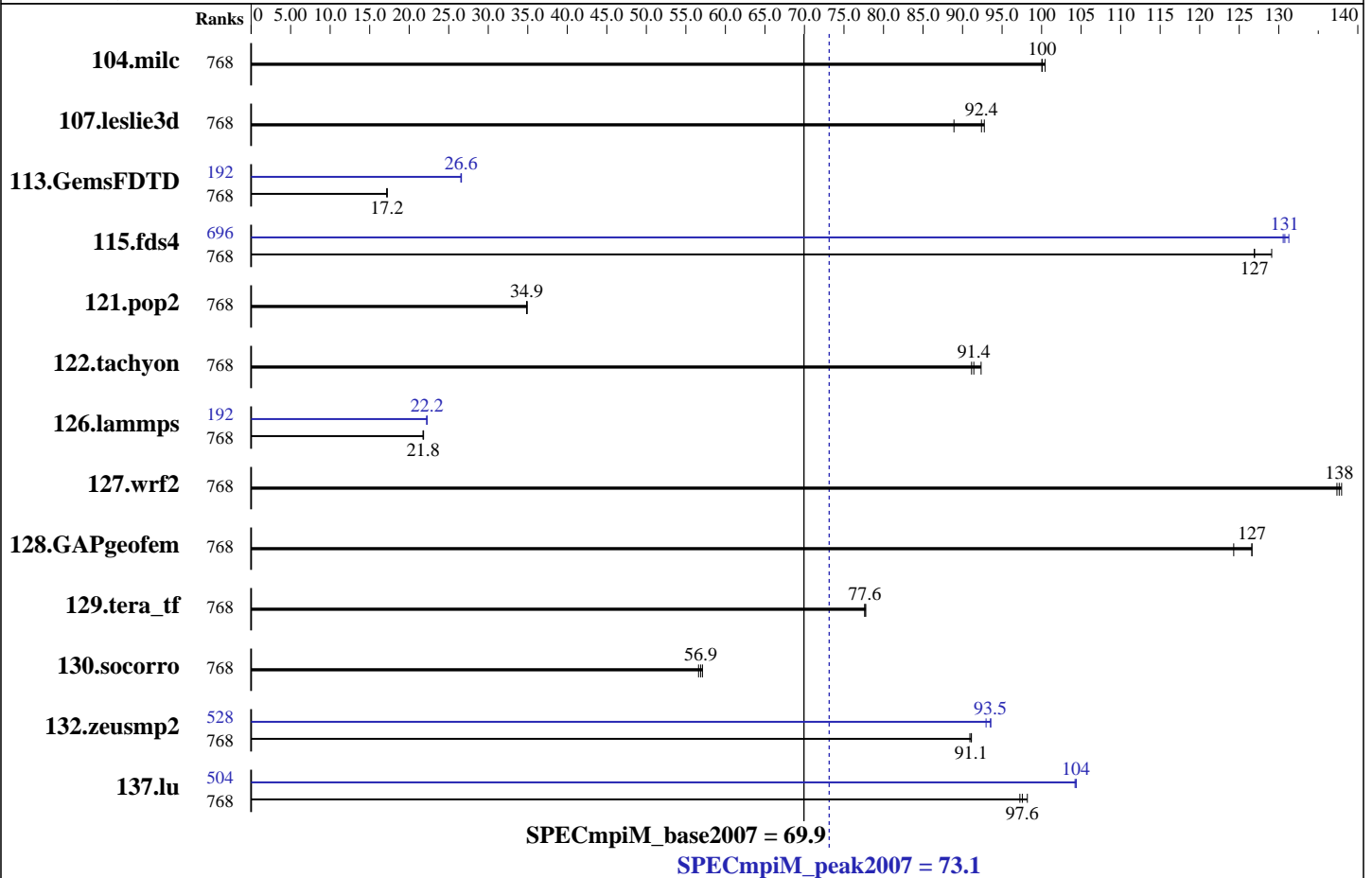
Test sponsor: SGI

Tested by: SGI

Test date: Sep-2010

Hardware Availability: May-2010

Software Availability: Oct-2010



Results Table

Benchmark	Base								Peak							
	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio		
104.milc	768	15.6	100	<u>15.6</u>	<u>100</u>	15.6	100	768	15.6	100	<u>15.6</u>	<u>100</u>	15.6	100		
107.leslie3d	768	58.7	88.9	<u>56.5</u>	<u>92.4</u>	56.3	92.7	768	58.7	88.9	<u>56.5</u>	<u>92.4</u>	56.3	92.7		
113.GemsFDTD	768	368	17.2	<u>367</u>	<u>17.2</u>	366	17.2	192	237	26.6	<u>237</u>	<u>26.6</u>	238	26.5		
115.fds4	768	15.1	129	15.4	127	<u>15.4</u>	<u>127</u>	696	14.9	131	<u>14.9</u>	<u>131</u>	14.9	131		
121.pop2	768	118	34.9	<u>118</u>	<u>34.9</u>	118	34.9	768	118	34.9	<u>118</u>	<u>34.9</u>	118	34.9		
122.tachyon	768	30.7	91.1	30.3	92.3	<u>30.6</u>	<u>91.4</u>	768	30.7	91.1	30.3	92.3	<u>30.6</u>	<u>91.4</u>		
126.lammps	768	134	21.8	134	21.8	<u>134</u>	<u>21.8</u>	192	<u>131</u>	<u>22.2</u>	131	22.2	131	22.2		
127.wrf2	768	<u>56.6</u>	<u>138</u>	56.5	138	56.8	137	768	<u>56.6</u>	<u>138</u>	56.5	138	56.8	137		
128.GAPgeofem	768	16.6	124	16.3	127	<u>16.3</u>	<u>127</u>	768	16.6	124	16.3	127	<u>16.3</u>	<u>127</u>		
129.tera_tf	768	<u>35.7</u>	<u>77.6</u>	35.7	77.6	35.6	77.8	768	<u>35.7</u>	<u>77.6</u>	35.7	77.6	35.6	77.8		

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	67.4	56.6	66.8	57.1	67.1	56.9	768	67.4	56.6	66.8	57.1	67.1	56.9
132.zeusmp2	768	34.1	91.1	34.1	90.9	34.1	91.1	528	33.2	93.6	33.2	93.5	33.4	93.0
137.lu	768	37.7	97.6	37.4	98.2	37.8	97.3	504	35.3	104	35.2	104	35.2	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 Altix ICE 8400EX Compute Node
 Interconnects: InfiniBand (MPI)
 InfiniBand (I/O)
 File Server Node: SGI InfiniteStorage Nexis 2000 NAS
 Total Compute Nodes: 64
 Total Chips: 128
 Total Cores: 768
 Total Threads: 1536
 Total Memory: 1536 GB
 Base Ranks Run: 768
 Minimum Peak Ranks: 192
 Maximum Peak Ranks: 768

Software Summary

C Compiler: Intel C Compiler for Linux
 Version 11.1, Build 20100414
 C++ Compiler: Intel C++ Compiler for Linux
 Version 11.1, Build 20100414
 Fortran Compiler: Intel Fortran Compiler for Linux
 Version 11.1, Build 20100414
 Base Pointers: 64-bit
 Peak Pointers: 64-bit
 MPI Library: SGI MPT 2.02 Beta
 Other MPI Info: OFED 1.4.2
 Pre-processors: None
 Other Software: None

Node Description: SGI Altix ICE 8400EX Compute Node

Hardware

Number of nodes: 64
 Uses of the node: compute
 Vendor: SGI
 Model: SGI Altix ICE 8400EX (Intel Xeon X5680, 3.33 GHz)
 CPU Name: Intel Xeon X5680
 CPU(s) orderable: 1-2 chips
 Chips enabled: 2
 Cores enabled: 12
 Cores per chip: 6
 Threads per core: 2
 CPU Characteristics: Six Core, 3.33 GHz, 6.4 GT/s QPI
 Intel Turbo Boost Technology up to 3.6 GHz
 Hyper-Threading Technology enabled
 CPU MHz: 3333
 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*4GB DDR3-1333 CL9 RDIMMs)
 Disk Subsystem: None
 Other Hardware: None
 Adapter: Mellanox MT26428 ConnectX IB QDR
 (PCIe x8 Gen2 5 GT/s)
 Number of Adapters: 2

Software

Adapter: Mellanox MT26428 ConnectX IB QDR
 (PCIe x8 Gen2 5 GT/s)
 Adapter Driver: OFED-1.4.2
 Adapter Firmware: 2.7.200
 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 7 for Linux Service Pack 1,
 SGI Tempo V 2.1

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Software Availability: Oct-2010

Node Description: SGI Altix ICE 8400EX Compute Node

Slot Type: PCIe x8 Gen2
Data Rate: InfiniBand 4x QDR
Ports Used: 1
Interconnect Type: InfiniBand

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: 24 GB (6*4GB 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 MT26418 ConnectX, MT25208 InfiniHost III Ex
(PCIe x8 Gen2 5 GT/s, PCIe x8 Gen1 2.5 GT/s)
Number of Adapters: 2
Slot Type: PCIe x8 Gen2, PCIe x8 Gen1
Data Rate: InfiniBand 4x DDR
Ports Used: 2
Interconnect Type: InfiniBand

Software

Adapter: Mellanox MT26418 ConnectX, MT25208 InfiniHost III Ex
(PCIe x8 Gen2 5 GT/s, PCIe x8 Gen1 2.5 GT/s)
Adapter Driver: OFED-1.4.0
Adapter Firmware: 2.6.0 and 5.2.0
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

Interconnect Description: InfiniBand (MPI)

Hardware

Vendor: Mellanox Technologies and SGI
Model: MT26428 ConnectX
Switch Model: SGI QDR_1.5_HYPR_2454 with Mellanox Device 48438
(Infiniscale IV)
Number of Switches: 32
Number of Ports: 36

Software

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Software Availability: Oct-2010

Interconnect Description: InfiniBand (MPI)

Data Rate: InfiniBand 4x QDR
Firmware: 5030005
Topology: Enhanced Hypercube
Primary Use: MPI traffic

Interconnect Description: InfiniBand (I/O)

	Hardware	Software
Vendor:	Mellanox Technologies and SGI	
Model:	MT26428 ConnectX	
Switch Model:	SGI QDR_1.5_HYPR_2454 with Mellanox Device 48438 (Infiniscale IV)	
Number of Switches:	16	
Number of Ports:	36	
Data Rate:	InfiniBand 4x QDR	
Firmware:	5030005	
Topology:	Enhanced Hypercube	
Primary Use:	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_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,
```

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General Notes (Continued)

16 switches for 768 ranks, 32 switches for 1536 ranks.

Compiler Invocation

C benchmarks:

icc

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

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

Peak Optimization Flags

C benchmarks:

104.milc: basepeak = yes

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Peak Optimization Flags (Continued)

122.tachyon: basepeak = yes

C++ benchmarks:

126.lammps: -O3 -xSSE4.2 -no-prec-div -ansi-alias

Fortran benchmarks:

107.leslie3d: basepeak = yes

113.GemsFDTD: -O3 -xSSE4.2 -no-prec-div

129.tera_tf: basepeak = yes

137.lu: Same as 113.GemsFDTD

Benchmarks using both Fortran and C:

115.fds4: -O3 -xSSE4.2 -no-prec-div

121.pop2: basepeak = yes

127.wrf2: basepeak = yes

128.GAPgeofem: basepeak = yes

130.socorro: basepeak = yes

132.zeusmp2: Same as 115.fds4

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_Intel1111_flags.html

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

http://www.spec.org/mpi2007/flags/SGI_x86_64_Intel1111_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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