SPEC® MPIM2007 Result

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SGI

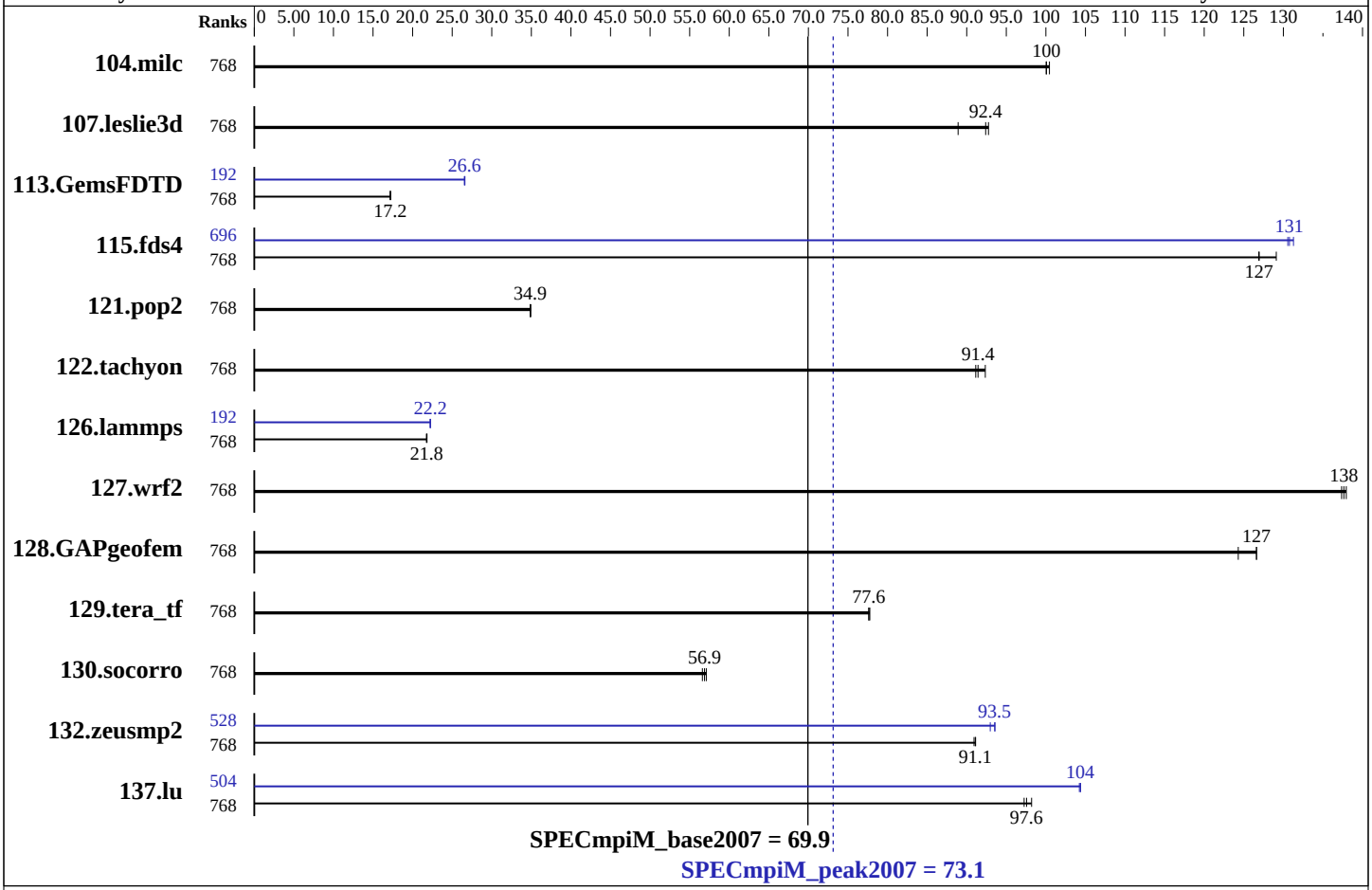
SGI Altix ICE 8400EX
(Intel Xeon X5680, 3.33 GHz)

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

Continued on next page

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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MPI2007 license: 4
Test sponsor: SGI
Tested by: SGI

Test date: Sep-2010
Hardware Availability: May-2010
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

Continued on next page

Interconnect Description: InfiniBand (MPI)

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

Interconnect Description: InfiniBand (I/O)

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:	16
Number of Ports:	36
Data Rate:	InfiniBand 4x QDR
Firmware:	5030005
Topology:	Enhanced Hypercube
Primary Use:	I/O traffic

Software

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,
```

Continued on next page

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

Continued on next page

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`

The flags file that was used to format this result can be browsed at
http://www.spec.org/mpi2007/flags/SGI_x86_64_Intel111_flags.html

You can also download the XML flags source by saving the following link:
http://www.spec.org/mpi2007/flags/SGI_x86_64_Intel111_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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