SPEC® MPIM2007 Result

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SGI

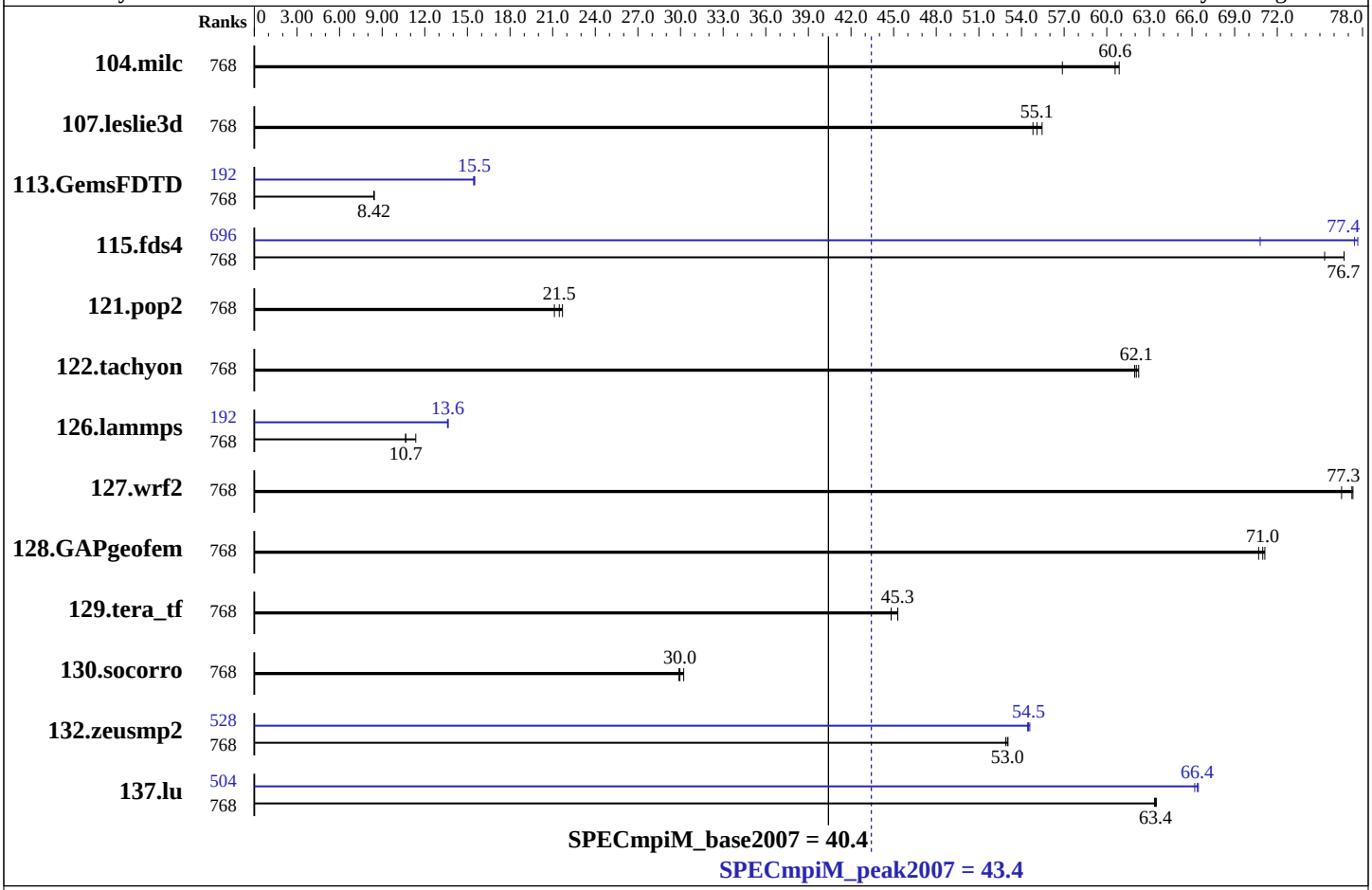
SGI Altix ICE 8400EX
(AMD Opteron 6180 SE, 2.5GHz)

SPECmpiM_peak2007 = 43.4

SPECmpiM_base2007 = 40.4

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

Test date: Jun-2011
Hardware Availability: Mar-2011
Software Availability: Aug-2011



Results Table

Benchmark	Base							Peak						
	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
104.milc	768	27.5	56.9	**25.8**	**60.6**	25.7	60.9	768	27.5	56.9	**25.8**	**60.6**	25.7	60.9
107.leslie3d	768	95.2	54.8	94.1	55.4	**94.8**	**55.1**	768	95.2	54.8	94.1	55.4	**94.8**	**55.1**
113.GemsFDTD	768	747	8.45	749	8.42	**749**	**8.42**	192	409	15.4	**407**	**15.5**	407	15.5
115.fds4	768	25.4	76.7	**25.4**	**76.7**	25.9	75.3	696	27.6	70.8	25.1	77.7	**25.2**	**77.4**
121.pop2	768	**192**	**21.5**	190	21.7	195	21.1	768	**192**	**21.5**	190	21.7	195	21.1
122.tachyon	768	45.1	62.0	**45.1**	**62.1**	44.9	62.2	768	45.1	62.0	**45.1**	**62.1**	44.9	62.2
126.lammps	768	256	11.4	274	10.7	**273**	**10.7**	192	214	13.6	**214**	**13.6**	214	13.6
127.wrf2	768	102	76.5	101	77.3	**101**	**77.3**	768	102	76.5	101	77.3	**101**	**77.3**
128.GAPgeofem	768	29.0	71.1	**29.1**	**71.0**	29.2	70.7	768	29.0	71.1	**29.1**	**71.0**	29.2	70.7
129.tera_tf	768	**61.1**	**45.3**	61.1	45.3	61.8	44.8	768	**61.1**	**45.3**	61.1	45.3	61.8	44.8

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	**127**	**30.0**	126	30.2	128	29.9	768	**127**	**30.0**	126	30.2	128	29.9
132.zeusmp2	768	58.5	53.0	**58.5**	**53.0**	58.7	52.9	528	57.0	54.4	**56.9**	**54.5**	56.8	54.6
137.lu	768	**58.0**	**63.4**	58.0	63.4	57.9	63.5	504	55.5	66.2	55.3	66.4	**55.4**	**66.4**

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
Interconnect:	InfiniBand (MPI and I/O)
File Server Node:	SGI InfiniteStorage 4000
Total Compute Nodes:	32
Total Chips:	64
Total Cores:	768
Total Threads:	768
Total Memory:	2 TB
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 20100806
C++ Compiler:	Intel C++ Compiler for Linux Version 11.1, Build 20100806
Fortran Compiler:	Intel Fortran Compiler for Linux Version 11.1, Build 20100806
Base Pointers:	64-bit
Peak Pointers:	64-bit
MPI Library:	SGI MPT 2.04 Patch 10789
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:	32
Uses of the node:	compute
Vendor:	SGI
Model:	SGI Altix ICE 8400EX (AMD Opteron 6180 SE, 2.5GHz)
CPU Name:	AMD Opteron 6180 SE
CPU(s) orderable:	1-2 chips
Chips enabled:	2
Cores enabled:	24
Cores per chip:	12
Threads per core:	1
CPU Characteristics:	12 Cores/chip, 2.5 GHz
CPU MHz:	2500
Primary Cache:	64 KB I + 64 KB D on chip per core
Secondary Cache:	512 KB I+D on chip per core
L3 Cache:	12 MB I+D on chip per chip, 6 MB shared / 6 cores
Other Cache:	None
Memory:	64 GB (16 x 4 GB, 2Rx4 PC3-10600R-9, ECC)
Disk Subsystem:	None
Other Hardware:	None
Adapter:	Mellanox MT26428 ConnectX IB QDR (PCIe x8 Gen2 5 GT/s)
Number of Adapters:	1
Slot Type:	PCIe x8 Gen2
Data Rate:	InfiniBand 4x QDR

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:	2.7.0
Operating System:	SUSE Linux Enterprise Server 11 SP1 (x86_64) Kernel 2.6.32.27-0.2-default
Local File System:	NFSv3
Shared File System:	NFSv3 IPoIB
System State:	Run Level 3 (Multi-User)
Other Software:	SGI Performance Suite 1.0, Build 702r19.sles11-1010072114 SGI Tempo Compute Node 2.2, Build 702r19.sles11-1010072114

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Test date: Jun-2011
Hardware Availability: Mar-2011
Software Availability: Aug-2011

Node Description: SGI Altix ICE 8400EX Compute Node

Ports Used:	2
Interconnect Type:	InfiniBand

Node Description: SGI InfiniteStorage 4000

Hardware

Number of nodes:	1
Uses of the node:	fileserver
Vendor:	SGI
Model:	SGI Altix 450 (Intel Itanium 2, 1.6GHz)
CPU Name:	Intel Itanium 2 9030
CPU(s) orderable:	2-38 chips
Chips enabled:	2
Cores enabled:	4
Cores per chip:	2
Threads per core:	1
CPU Characteristics:	1.6GHz/8MB, 533MHz FSB
CPU MHz:	1600
Primary Cache:	16 KB I + 16 KB D on chip per core
Secondary Cache:	1 MB I + 256 KB D on chip per core
L3 Cache:	4 MB I+D on chip per core
Other Cache:	None
Memory:	24 GB (12 x 2 GB, 2Rx4 PC2-3200-3, ECC)
Disk Subsystem:	16 TB RAID 5 32 x 500 GB SATA (Seagate Barracuda 7.2K)
Other Hardware:	None
Adapter:	Mellanox MT25208 InfiniHost III Ex (PCIe x8 Gen1 2.5 GT/s)
Number of Adapters:	2
Slot Type:	PCIe x8 Gen1
Data Rate:	InfiniBand 4x DDR
Ports Used:	2
Interconnect Type:	InfiniBand

Software

Adapter:	Mellanox MT25208 InfiniHost III Ex (PCIe x8 Gen1 2.5 GT/s)
Adapter Driver:	OFED-1.4.2
Adapter Firmware:	5.3.0
Operating System:	SUSE Linux Enterprise Server 11 SP1 (ia64) Kernel 2.6.32.12-0.7-default
Local File System:	xfs
Shared File System:	--
System State:	Run Level 3 (Multi-User)
Other Software:	SGI ProPack 7SP1 for Linux, Build 701r2.sles11-1005242307

Interconnect Description: InfiniBand (MPI and I/O)

Hardware

Vendor:	Mellanox Technologies and SGI
Model:	None
Switch Model:	SGI QDR_1.5_HYPR_2454 with Mellanox Device 48438 (Infiniscale IV)
Number of Switches:	4
Number of Ports:	36
Data Rate:	InfiniBand 4x QDR
Firmware:	5040005
Topology:	Enhanced Hypercube

Software

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Test date: Jun-2011
Hardware Availability: Mar-2011
Software Availability: Aug-2011

Interconnect Description: InfiniBand (MPI and I/O)

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_BUFS_THRESHOLD=1
  ulimit -s unlimited

BIOS settings:
  AMI BIOS version 1.0a

Job Placement:
  Each MPI job is assigned to a topologically compact
  set of nodes, i.e. the minimal needed number of switches was
  used for each job: 1 switch for up to 192 ranks, 2 switches
  for 384 ranks, 4 switches for 768 ranks, 8 switches for
  1536 ranks and 16 switches for 3072 ranks.

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`

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 -xSSE2 -ipo -no-prec-div`

C++ benchmarks:

126.lammps: `-O3 -xSSE2 -ipo -no-prec-div -ansi-alias`

Fortran benchmarks:
`-O3 -xSSE2 -ipo -no-prec-div`

Benchmarks using both Fortran and C:
`-O3 -xSSE2 -ipo -no-prec-div`

Peak Optimization Flags

C benchmarks:

104.milc: `basepeak = yes`

122.tachyon: `basepeak = yes`

C++ benchmarks:

126.lammps: `-O3 -xSSE2 -ipo -no-prec-div -ansi-alias`

Fortran benchmarks:

107.leslie3d: `basepeak = yes`

113.GemsFDTD: `-O3 -xSSE2 -ipo -no-prec-div`

129.tera_tf: `basepeak = yes`

137.lu: `Same as 113.GemsFDTD`

Benchmarks using both Fortran and C:

115.fds4: `-O3 -xSSE2 -ipo -no-prec-div`

121.pop2: `basepeak = yes`

Continued on next page

Peak Optimization Flags (Continued)

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.20120720.00.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.20120720.00.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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