SPEC® MPIM2007 Result

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SGI

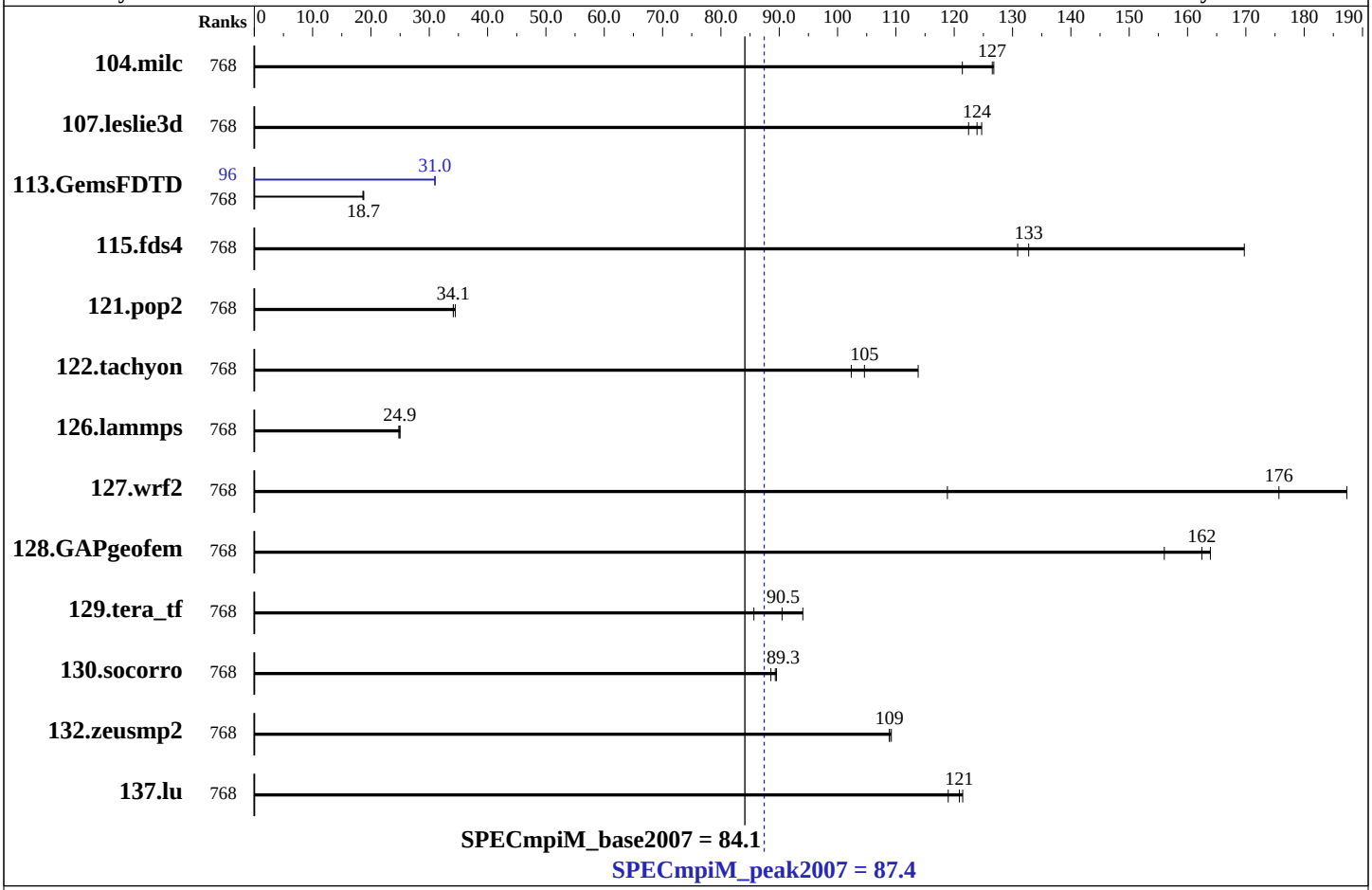
SGI Rackable C2112-4RP4
(Intel Xeon E5-2697 v2, 2.70 GHz)

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

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)

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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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(Intel Xeon E5-2697 v2, 2.70 GHz)

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

Test date: Aug-2013
Hardware Availability: Sep-2013
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

Continued on next page

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
```

Continued on next page

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`

Continued on next page

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.

Tested with SPEC MPI2007 v2.0.1.
Report generated on Tue Jul 22 13:47:21 2014 by SPEC MPI2007 PS/PDF formatter v1463.
Originally published on 18 September 2013.