SPEC® MPIM2007 Result

SGI

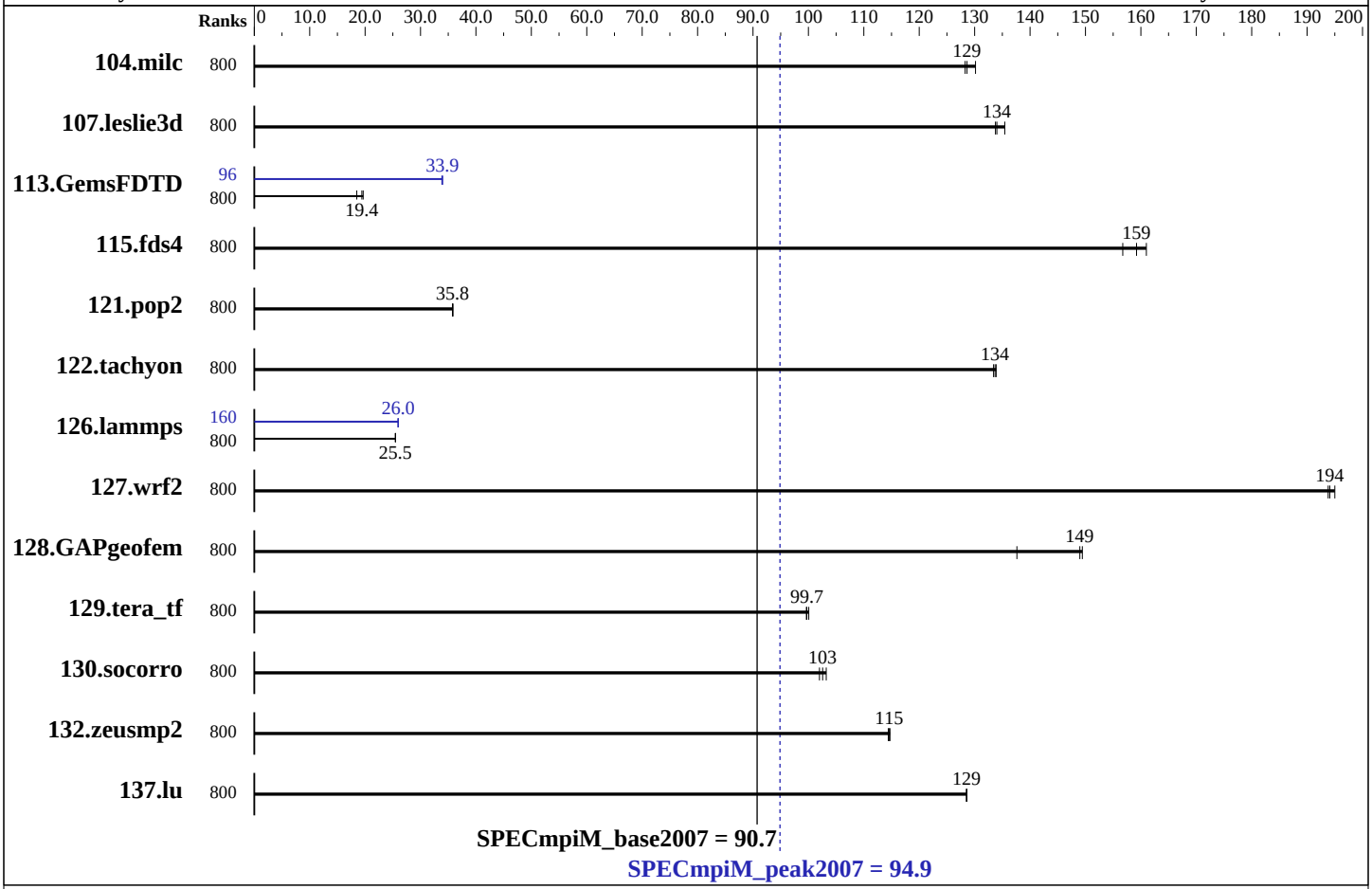
SGI ICE X (Intel Xeon E5-2690 v2, 3.0 GHz)

SPECmpiM_peak2007 = 94.9

SPECmpiM_base2007 = 90.7

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

Test date: Sep-2013
Hardware Availability: Sep-2013
Software Availability: Jul-2013



Results Table

Benchmark	Base							Peak						
	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
104.milc	800	12.0	130	12.2	128	**12.2**	**129**	800	12.0	130	12.2	128	**12.2**	**129**
107.leslie3d	800	**39.0**	**134**	39.0	134	38.5	135	800	**39.0**	**134**	39.0	134	38.5	135
113.GemsFDTD	800	**325**	**19.4**	341	18.5	321	19.7	96	186	33.9	**186**	**33.9**	186	34.0
115.fds4	800	12.1	161	12.4	157	**12.3**	**159**	800	12.1	161	12.4	157	**12.3**	**159**
121.pop2	800	115	35.8	115	35.9	**115**	**35.8**	800	115	35.8	115	35.9	**115**	**35.8**
122.tachyon	800	20.9	134	**20.9**	**134**	21.0	133	800	20.9	134	**20.9**	**134**	21.0	133
126.lammps	800	114	25.5	114	25.5	**114**	**25.5**	160	112	26.0	112	25.9	**112**	**26.0**
127.wrf2	800	**40.2**	**194**	40.0	195	40.2	194	800	**40.2**	**194**	40.0	195	40.2	194
128.GAPgeofem	800	15.0	138	**13.9**	**149**	13.8	149	800	15.0	138	**13.9**	**149**	13.8	149
129.tera_tf	800	**27.8**	**99.7**	27.7	100	27.8	99.6	800	**27.8**	**99.7**	27.7	100	27.8	99.6

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	800	37.0	103	**37.2**	**103**	37.4	102	800	37.0	103	**37.2**	**103**	37.4	102
132.zeusmp2	800	27.0	115	**27.1**	**115**	27.1	114	800	27.0	115	**27.1**	**115**	27.1	114
137.lu	800	28.6	129	**28.6**	**129**	28.6	129	800	28.6	129	**28.6**	**129**	28.6	129

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 ICE X Compute Node
Interconnect:	InfiniBand (MPI and I/O)
File Server Node:	SGI Rackable C1103-TY12
Total Compute Nodes:	40
Total Chips:	80
Total Cores:	800
Total Threads:	1600
Total Memory:	2560 GB
Base Ranks Run:	800
Minimum Peak Ranks:	96
Maximum Peak Ranks:	800

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 ICE X Compute Node

Hardware

Number of nodes:	40
Uses of the node:	compute
Vendor:	SGI
Model:	SGI ICE X (Intel Xeon E5-2690 v2, 3.0 GHz)
CPU Name:	Intel Xeon E5-2690 v2
CPU(s) orderable:	1-2 chips
Chips enabled:	2
Cores enabled:	20
Cores per chip:	10
Threads per core:	2
CPU Characteristics:	Ten Core, 3.0 GHz, 8.0 GT/s QPI Hyper-Threading Technology enabled
CPU MHz:	3000
Primary Cache:	32 KB I + 32 KB D on chip per core
Secondary Cache:	256 KB I+D on chip per core
L3 Cache:	25 MB I+D on chip per chip
Other Cache:	None
Memory:	64 GB (8 x 8 GB 2Rx4 PC3-14900R-13, ECC)
Disk Subsystem:	None
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

Continued on next page

Software

Adapter:	Mellanox MT27500 with ConnectX-3 ASIC (PCIe x8 Gen3 8 GT/s)
Adapter Driver:	OFED-1.5.2
Adapter Firmware:	2.7.8200
Operating System:	SUSE Linux Enterprise Server 11 SP2, Kernel 3.0.80-0.7-default
Local File System:	NFSv3
Shared File System:	NFSv3 IPoIB
System State:	Multi-user, run level 3
Other Software:	SGI Tempo Compute Node 2.7.3, Build 708rp14.sles11sp2-130531120

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

Test date: Sep-2013
Hardware Availability: Sep-2013
Software Availability: Jul-2013

Node Description: SGI ICE X Compute Node

Data Rate:	InfiniBand 4x FDR
Ports Used:	1
Interconnect Type:	InfiniBand

Node Description: SGI Rackable C1103-TY12

Hardware

Number of nodes:	1
Uses of the node:	fileserver
Vendor:	SGI
Model:	SGI Rackable C1103-TY12 (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:	96 GB (8 * 12 GB 2Rx4 PC3-10600R-9, ECC)
Disk Subsystem:	36 TB RAID 6 36 x 1 TB SAS (Seagate Constellation 7200RPM)
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:	2.11.312
Operating System:	SUSE Linux Enterprise Server 11 SP1 Kernel 2.6.32.54-0.3-default
Local File System:	xfs
Shared File System:	--
System State:	Multi-user, run level 3
Other Software:	SGI Foundation Software 2.5, Build 705r10.sles11-1110192111 SGI InfiniteStorage Software Platform, version 2.5, Build 705r10.sles11-1110192111

Interconnect Description: InfiniBand (MPI and I/O)

Hardware

Vendor:	Mellanox Technologies and SGI
Model:	None
Switch Model:	SGI FDR Integrated IB Switch Blade 2SW9x27 with Mellanox SwitchX device 51000
Number of Switches:	10
Number of Ports:	36
Data Rate:	InfiniBand 4x FDR

Software

Continued on next page

Interconnect Description: InfiniBand (MPI and I/O)

Firmware:	07130007_LLR and 08130007_LLR
Topology:	Enhanced Hypercube
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
   export MPI_IB_RAILS=2
   ulimit -s unlimited

 BIOS settings:
   AMI BIOS version 3.0
   Hyper-Threading Technology enabled (default)
   Intel Turbo Boost Technology disabled

 Transparent Hugepage: Disabled

 Job Placement:
   Each MPI job was assigned to a topologically compact set
   of nodes.

 Additional notes regarding interconnect:
   The Infiniband network consists of two independent planes,
   with half the switches in the system allocated to each plane.
   I/O traffic is restricted to one plane, while MPI traffic can
   use both planes.

 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: `-O3 -xAVX -no-prec-div -ansi-alias`

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`

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 13:47:40 2014 by SPEC MPI2007 PS/PDF formatter v1463.
Originally published on 2 October 2013.