SPEC® MPIL2007 Result

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SGI

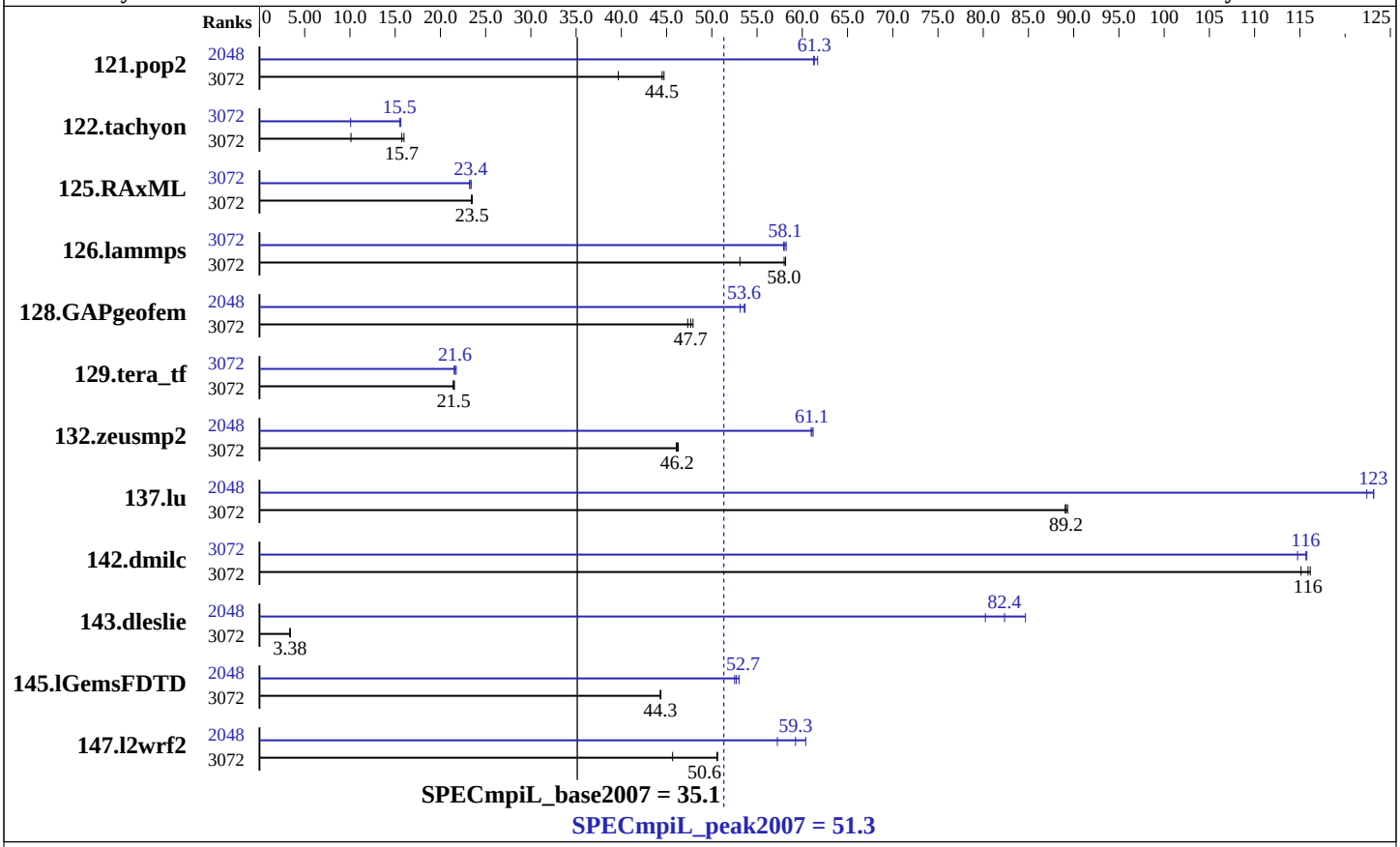
SGI Altix ICE 8400EX
(Intel Xeon X5670, 2.93 GHz)

SPECmpiL_peak2007 = 51.3

SPECmpiL_base2007 = 35.1

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

Test date: Apr-2010
Hardware Availability: May-2010
Software Availability: Feb-2010



Results Table

Benchmark	Base							Peak						
	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
121.pop2	3072	98.1	39.7	87.0	44.7	**87.4**	**44.5**	2048	63.1	61.7	63.5	61.2	**63.4**	**61.3**
122.tachyon	3072	192	10.1	**124**	**15.7**	122	16.0	3072	193	10.1	124	15.6	**125**	**15.5**
125.RAxML	3072	125	23.4	124	23.5	**124**	**23.5**	3072	125	23.4	**125**	**23.4**	126	23.2
126.lammps	3072	46.3	53.1	42.3	58.2	**42.4**	**58.0**	3072	42.2	58.2	**42.3**	**58.1**	42.4	57.9
128.GAPgeofem	3072	**124**	**47.7**	125	47.3	124	47.9	2048	112	53.1	**111**	**53.6**	111	53.7
129.tera_tf	3072	**51.2**	**21.5**	51.0	21.5	51.3	21.4	3072	51.1	21.5	50.5	21.8	**50.8**	**21.6**
132.zeusmp2	3072	46.0	46.1	**45.9**	**46.2**	45.8	46.3	2048	**34.7**	**61.1**	34.6	61.2	34.8	61.0
137.lu	3072	47.0	89.3	**47.1**	**89.2**	47.2	89.1	2048	**34.1**	**123**	34.1	123	34.3	122
142.dmilc	3072	32.0	115	**31.8**	**116**	31.7	116	3072	31.8	116	**31.9**	**116**	32.1	115
143.dleslie	3072	916	3.38	917	3.38	**917**	**3.38**	2048	**37.6**	**82.4**	36.6	84.7	38.6	80.2
145.lGemsFDTD	3072	**99.5**	**44.3**	99.4	44.4	99.5	44.3	2048	84.0	52.5	83.2	53.0	**83.7**	**52.7**
147.l2wrf2	3072	180	45.7	**162**	**50.6**	162	50.6	2048	143	57.2	**138**	**59.3**	136	60.4

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

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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:	256
Total Chips:	512
Total Cores:	3072
Total Threads:	6144
Total Memory:	6 TB
Base Ranks Run:	3072
Minimum Peak Ranks:	2048
Maximum Peak Ranks:	3072

Software Summary

C Compiler:	Intel C Compiler for Linux Version 11.1, Build 20100203
C++ Compiler:	Intel C++ Compiler for Linux Version 11.1, Build 20100203
Fortran Compiler:	Intel Fortran Compiler for Linux Version 11.1, Build 20100203
Base Pointers:	64-bit
Peak Pointers:	64-bit
MPI Library:	SGI MPT 1.26
Other MPI Info:	OFED 1.4.1
Pre-processors:	None
Other Software:	None

Node Description: SGI Altix ICE 8400EX Compute Node

Hardware

Number of nodes:	256
Uses of the node:	compute
Vendor:	SGI
Model:	SGI Altix ICE 8400EX (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 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:	1
Slot Type:	PCIe x8 Gen2
Data Rate:	InfiniBand 4x QDR
Ports Used:	2
Interconnect Type:	InfiniBand

Software

Adapter:	Mellanox MT26428 ConnectX IB QDR (PCIe x8 Gen2 5 GT/s)
Adapter Driver:	OFED-1.4.1
Adapter Firmware:	2.7.0
Operating System:	SUSE Linux Enterprise Server 10 (x86_64) SP3 Kernel 2.6.16.60-0.54.5-smp
Local File System:	NFSv3
Shared File System:	NFSv3 IPoIB
System State:	Multi-user, run level 3
Other Software:	SGI ProPack 6 for Linux Service Pack 6, SGI Tempo V 1.10

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Test date: Apr-2010
Hardware Availability: May-2010
Software Availability: Feb-2010

Node Description: SGI InfiniteStorage Nexis 2000 NAS

Hardware

Number of nodes:	1
Uses of the node:	fileserver
Vendor:	SGI
Model:	SGI Altix XE 240 (Intel Xeon 5140, 2.33 GHz)
CPU Name:	Intel Xeon 5140
CPU(s) orderable:	1-2 chips
Chips enabled:	2
Cores enabled:	4
Cores per chip:	2
Threads per core:	1
CPU Characteristics:	1333 MHz FSB
CPU MHz:	2333
Primary Cache:	32 KB I + 32 KB D on chip per core
Secondary Cache:	4 MB I+D on chip per chip
L3 Cache:	None
Other Cache:	None
Memory:	16 GB (8*2GB DDR2-667MHz DIMMS)
Disk Subsystem:	4.3 TB RAID 5 48 x 146 GB SAS (Seagate Cheetah 15K.5)
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-1.3
Adapter Firmware:	5.3.0
Operating System:	SUSE Linux Enterprise Server 10 (x86_64) SP1 Kernel 2.6.16.54-0.2.5-smp
Local File System:	xfs
Shared File System:	--
System State:	Multi-user, run level 5
Other Software:	SGI ProPack 5 for Linux Service Pack 5

Interconnect Description: InfiniBand (MPI)

Hardware

Vendor:	Mellanox Technologies
Model:	MT26428 ConnectX
Switch Model:	Mellanox MT48436 InfiniScale-IV
Number of Switches:	128
Number of Ports:	36
Data Rate:	InfiniBand 4x QDR
Firmware:	5030004
Topology:	Bristle hypercube
Primary Use:	MPI traffic

Software

Interconnect Description: InfiniBand (I/O)

Hardware

Vendor:	Mellanox Technologies
Model:	MT26428 ConnectX
Switch Model:	Mellanox MT48436 InfiniScale-IV
Number of Switches:	64
Number of Ports:	36
Data Rate:	InfiniBand 4x QDR
Firmware:	5030004
Topology:	Bristle hypercube
Primary Use:	I/O traffic

Software

Submit Notes

```
The config file option 'submit' was used.
For peak benchmarks that used 2048 MPI ranks, four ranks
were assigned to each CPU chip, leaving 2 cores per chip idle.
```

General Notes

```
Software environment:
  export MPI_REQUEST_MAX=65536
  export MPI_TYPE_MAX=32768
  export MPI_BUFS_THRESHOLD=1
  export MPI_DSM_DISTRIBUTE=yes
  export MPI_IB_RAILS=2
  ulimit -s unlimited
BIOS settings:
  AMI BIOS version 8.16
  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,
  16 switches for 768 ranks, 32 switches for 1536 ranks,
  64 switches for 3072 ranks.
```

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`

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`

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.20100202.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.20100202.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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