SPEC® MPIL2007 Result

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SGI

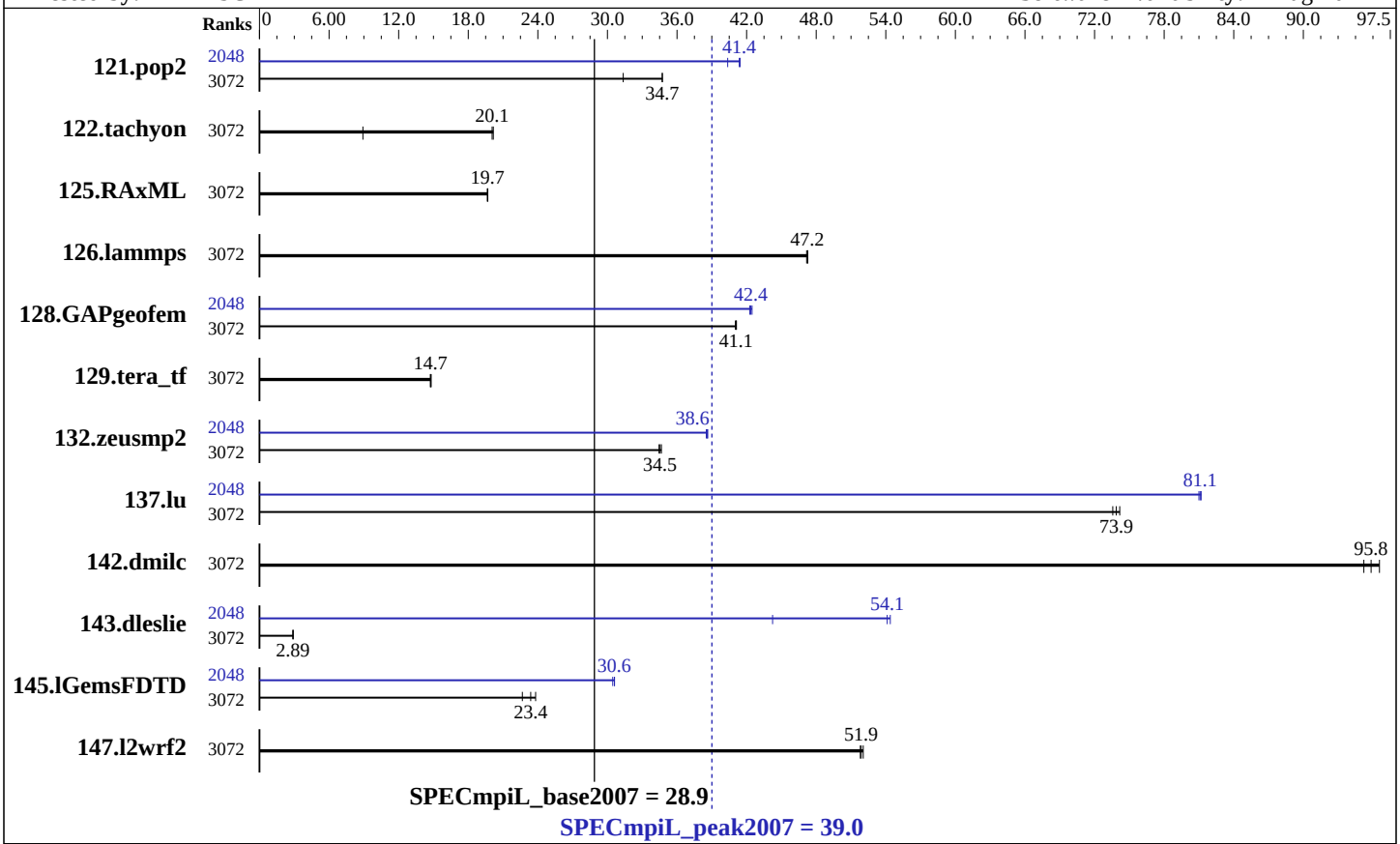
SGI Altix ICE 8400EX
(AMD Opteron 6180 SE, 2.5GHz)

SPECmpiL_peak2007 = 39.0

SPECmpiL_base2007 = 28.9

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
121.pop2	3072	124	31.4	112	34.7	**112**	**34.7**	2048	93.9	41.4	**94.1**	**41.4**	96.4	40.4
122.tachyon	3072	218	8.92	**96.9**	**20.1**	96.4	20.2	3072	218	8.92	**96.9**	**20.1**	96.4	20.2
125.RAxML	3072	148	19.7	148	19.7	**148**	**19.7**	3072	148	19.7	148	19.7	**148**	**19.7**
126.lammps	3072	52.0	47.3	52.1	47.2	**52.0**	**47.2**	3072	52.0	47.3	52.1	47.2	**52.0**	**47.2**
128.GAPgeofem	3072	**144**	**41.1**	144	41.1	145	41.0	2048	140	42.3	140	42.5	**140**	**42.4**
129.tera_tf	3072	**74.5**	**14.7**	74.5	14.7	74.2	14.8	3072	**74.5**	**14.7**	74.5	14.7	74.2	14.8
132.zeusmp2	3072	61.2	34.7	**61.4**	**34.5**	61.5	34.4	2048	54.9	38.6	**54.9**	**38.6**	55.0	38.5
137.lu	3072	57.1	73.6	**56.9**	**73.9**	56.7	74.2	2048	51.9	81.0	**51.8**	**81.1**	51.8	81.2
142.dmilc	3072	38.2	96.6	38.7	95.2	**38.4**	**95.8**	3072	38.2	96.6	38.7	95.2	**38.4**	**95.8**
143.dleslie	3072	1069	2.90	**1072**	**2.89**	1072	2.89	2048	**57.3**	**54.1**	70.1	44.2	57.0	54.4
145.lGemsFDTD	3072	**189**	**23.4**	195	22.7	185	23.8	2048	145	30.5	144	30.6	**144**	**30.6**
147.l2wrf2	3072	158	51.8	158	52.1	**158**	**51.9**	3072	158	51.8	158	52.1	**158**	**51.9**

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
Interconnect:	InfiniBand (MPI and I/O)
File Server Node:	SGI InfiniteStorage 4000
Total Compute Nodes:	128
Total Chips:	256
Total Cores:	3072
Total Threads:	3072
Total Memory:	8 TB
Base Ranks Run:	3072
Minimum Peak Ranks:	2048
Maximum Peak Ranks:	3072

Software Summary

C Compiler:	Intel C++ Composer XE 2011 for Linux, Version 12.0.3.174 Build 20110309
C++ Compiler:	Intel C++ Composer XE 2011 for Linux, Version 12.0.3.174 Build 20110309
Fortran Compiler:	Intel Fortran Composer XE 2011 for Linux, Version 12.0.3.174 Build 20110309
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:	128
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
Ports Used:	2
Interconnect Type:	InfiniBand

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 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
Model:	None
Switch Model:	Mellanox Infiniscale-IV
Number of Switches:	16
Number of Ports:	36
Data Rate:	InfiniBand 4x QDR
Firmware:	5040005
Topology:	Enhanced HyperCube
Primary Use:	MPI and 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 die, leaving two cores per die idle.
```

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:
  In the base run, 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.
```

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`

Base Optimization Flags

C benchmarks:
`-O3 -xSSE2 -no-prec-div`

Continued on next page

Base Optimization Flags (Continued)

C++ benchmarks:

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

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

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

Peak Optimization Flags

C benchmarks:

122.tachyon: `basepeak = yes`

125.RAxML: `basepeak = yes`

142.dmilc: `basepeak = yes`

C++ benchmarks:

126.lammps: `basepeak = yes`

Fortran benchmarks:

129.tera_tf: `basepeak = yes`

137.lu: `-O3 -xSSE2 -no-prec-div`

143.dleslie: `Same as 137.lu`

145.lGemsFDTD: `Same as 137.lu`

Benchmarks using both Fortran and C:

121.pop2: `-O3 -xSSE2 -no-prec-div`

128.GAPgeofem: `Same as 121.pop2`

132.zeusmp2: `Same as 121.pop2`

147.l2wrf2: `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_Intel12_flags.html`

You can also download the XML flags source by saving the following link:
`http://www.spec.org/mpi2007/flags/SGI_x86_64_Intel12_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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