SPEC® MPIL2007 Result

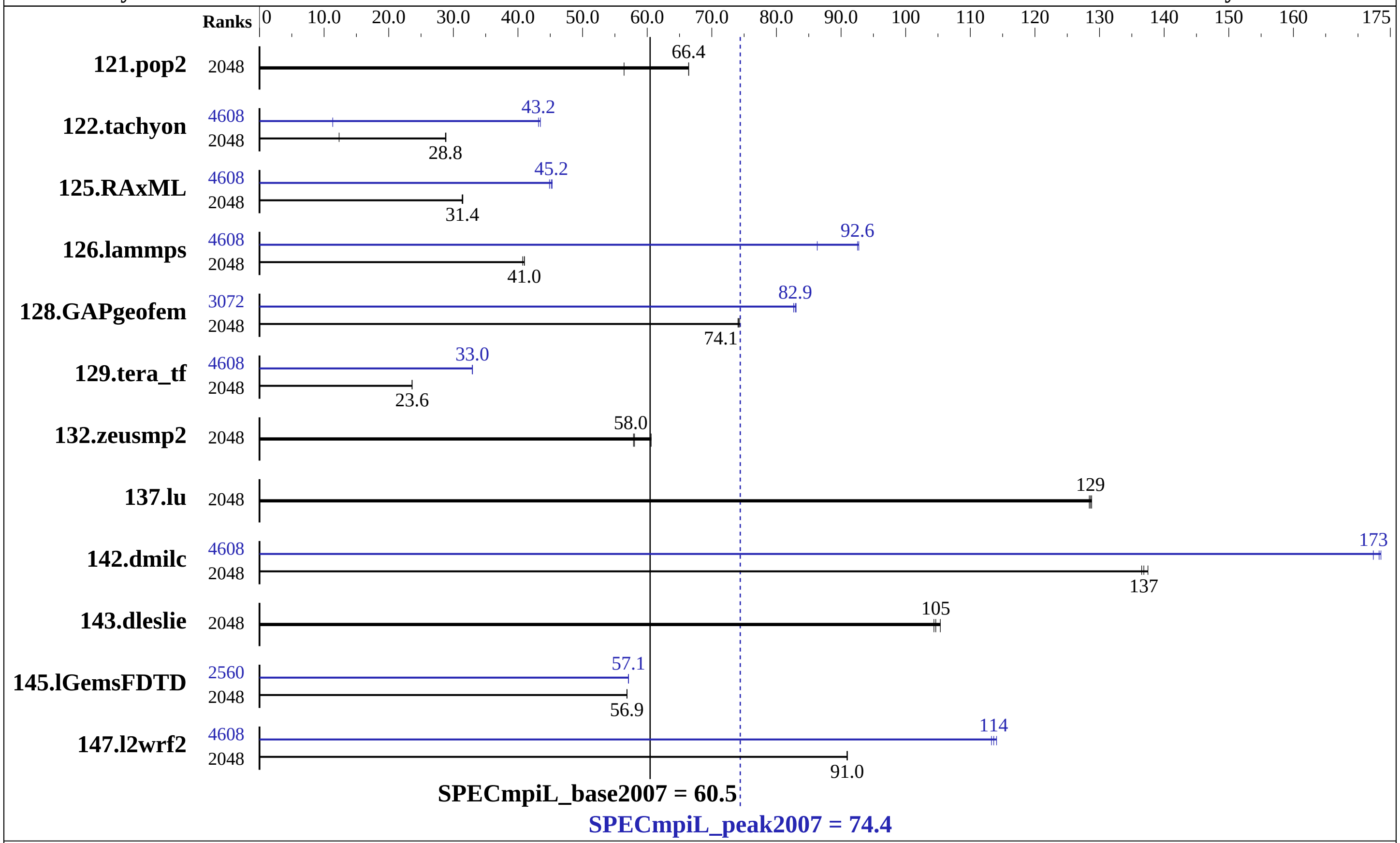
SGI

SGI Altix ICE 8400EX
(Intel Xeon X5690, 3.46 GHz)

SPECmpiL_peak2007 = 74.4

SPECmpiL_base2007 = 60.5

MPI2007 license:	4	**Test date:**	Nov-2011
Test sponsor:	SGI	**Hardware Availability:**	Feb-2011
Tested by:	SGI	**Software Availability:**	Nov-2011



Results Table

Benchmark	Base							Peak						
	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
121.pop2	2048	69.0	56.4	**58.6**	**66.4**	58.6	66.4	2048	69.0	56.4	**58.6**	**66.4**	58.6	66.4
122.tachyon	2048	158	12.3	**67.6**	**28.8**	67.3	28.9	4608	171	11.3	44.7	43.5	**45.0**	**43.2**
125.RAxML	2048	92.7	31.5	93.1	31.4	**92.9**	**31.4**	4608	**64.6**	**45.2**	65.0	44.9	64.4	45.3
126.lammps	2048	60.4	40.7	**60.0**	**41.0**	60.0	41.0	4608	28.5	86.3	26.5	92.7	**26.6**	**92.6**
128.GAPgeofem	2048	79.9	74.3	**80.0**	**74.1**	80.1	74.1	3072	71.5	83.0	**71.6**	**82.9**	71.8	82.7
129.tera_tf	2048	**46.5**	**23.6**	46.5	23.6	46.6	23.6	4608	33.4	32.9	33.3	33.0	**33.3**	**33.0**
132.zeusmp2	2048	35.0	60.6	**36.5**	**58.0**	36.6	57.9	2048	35.0	60.6	**36.5**	**58.0**	36.6	57.9
137.lu	2048	32.6	129	32.7	128	**32.7**	**129**	2048	32.6	129	32.7	128	**32.7**	**129**
142.dmilc	2048	26.8	137	**26.9**	**137**	27.0	137	4608	21.4	172	21.2	174	**21.3**	**173**
143.dleslie	2048	29.7	104	29.4	105	**29.6**	**105**	2048	29.7	104	29.4	105	**29.6**	**105**
145.lGemsFDTD	2048	77.6	56.9	**77.6**	**56.9**	77.5	56.9	2560	**77.2**	**57.1**	77.2	57.1	77.2	57.1
147.l2wrf2	2048	**90.2**	**91.0**	90.2	90.9	90.2	91.0	4608	72.4	113	**72.2**	**114**	71.9	114

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

SGI

SGI Altix ICE 8400EX
(Intel Xeon X5690, 3.46 GHz)

SPECmpiL_peak2007 = 74.4

SPECmpiL_base2007 = 60.5

MPI2007 license: 4		**Test date:**	Nov-2011
Test sponsor:	SGI	**Hardware Availability:**	Feb-2011
Tested by:	SGI	**Software Availability:**	Nov-2011

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 Nexis 2000 NAS
Total Compute Nodes:	384
Total Chips:	768
Total Cores:	4608
Total Threads:	9216
Total Memory:	9 TB
Base Ranks Run:	2048
Minimum Peak Ranks:	2048
Maximum Peak Ranks:	4608

Software Summary

C Compiler:	Intel C++ Composer XE 2011 for Linux, Version 12.1.0.233 Build 20110811
C++ Compiler:	Intel C++ Composer XE 2011 for Linux, Version 12.1.0.233 Build 20110811
Fortran Compiler:	Intel Fortran Composer XE 2011 for Linux, Version 12.1.0.233 Build 20110811
Base Pointers:	64-bit
Peak Pointers:	64-bit
MPI Library:	SGI MPT 2.05
Other MPI Info:	OFED 1.5.2
Pre-processors:	None
Other Software:	None

Node Description: SGI Altix ICE 8400EX Compute Node

Hardware

Number of nodes:	384
Uses of the node:	compute
Vendor:	SGI
Model:	SGI Altix ICE 8400EX IP-105 (Intel Xeon X5690, 3.46 GHz)
CPU Name:	Intel Xeon X5690
CPU(s) orderable:	1-2 chips
Chips enabled:	2
Cores enabled:	12
Cores per chip:	6
Threads per core:	2
CPU Characteristics:	Six Core, 3.46 GHz, 6.4 GT/s QPI Intel Turbo Boost Technology up to 3.73 GHz Hyper-Threading Technology enabled
CPU MHz:	3467
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 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:	2
Slot Type:	PCIe x8 Gen2
Data Rate:	InfiniBand 4x QDR
Ports Used:	1
Interconnect Type:	InfiniBand

Software

Adapter:	Mellanox MT26428 ConnectX IB QDR (PCIe x8 Gen2 5 GT/s)
Adapter Driver:	OFED-1.5.2
Adapter Firmware:	2.7.8200
Operating System:	SUSE Linux Enterprise Server 11 SP1, Kernel 2.6.32.43-0.4-default
Local File System:	NFSv3
Shared File System:	NFSv3 IPoIB
System State:	Multi-user, run level 3
Other Software:	SGI Performance Suite 1.2 Build 704r5.sles11-1103212004 SGI Tempo Compute Node 2.4, Build 704rp74.sles11-1106302006

Node Description: SGI InfiniteStorage Nexis 2000 NAS

Hardware

Number of nodes:	1
Uses of the node:	fileserver
Vendor:	SGI
Model:	SGI Altix XE 270 (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 (12*8 GB DDR3-1333 CL9 DIMMs)
Disk Subsystem:	8.8 TB RAID 5 60 x 146 GB SAS (Seagate Cheetah 15K.5)
Other Hardware:	None
Adapter:	Mellanox MT26428 ConnectX IB QDR (PCIe x8 Gen2 5 GT/s)
Number of Adapters:	2
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-1.4.0
Adapter Firmware:	2.7.0
Operating System:	SUSE Linux Enterprise Server 11 (x86_64) Kernel 2.6.27.19-5-default
Local File System:	xfs
Shared File System:	--
System State:	Multi-user, run level 3
Other Software:	SGI Foundation Software 2, Build 700r3.sles11-1004061553

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:	96
Number of Ports:	36
Data Rate:	InfiniBand 4x QDR
Firmware:	5040005
Topology:	Enhanced Hypercube
Primary Use:	MPI and I/O traffic

Software

SGI

SGI Altix ICE 8400EX
(Intel Xeon X5690, 3.46 GHz)

SPECmpiL_peak2007 = 74.4

SPECmpiL_base2007 = 60.5

MPI2007 license: 4		**Test date:**	Nov-2011
Test sponsor:	SGI	**Hardware Availability:**	Feb-2011
Tested by:	SGI	**Software Availability:**	Nov-2011

Submit Notes

```
The config file option 'submit' was used.
For benchmarks that used 2048 or 2560 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_IB_RAILS=2
  ulimit -s unlimited

BIOS settings:
  AMI BIOS version 080016
  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:
  In the run with 3072 and 4608 ranks, each MPI job was
  assigned to a topologically compact set of nodes with
  64 switches for 3072 ranks and 96 switches for 4608 ranks.
  In the run with 2048 and 2560 MPI ranks, four ranks were
  assigned to each CPU chip, leaving 2 cores per chip idle.
  There were 64 switches used for 2048 ranks and 80 switches
  used for 2560 ranks, with topology compact configurations
  in both cases.

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.

  SGI manufactures its own switch blades using unmodified Mellanox
  switch ASICs. The test system has SGI QDR_1.5_HYPR_2454 switch
  with Mellanox 36-port QDR Infiniband switch Device 48438
  (InfiniScale IV).
```

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`

Base 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`

Peak Optimization Flags

C benchmarks:
`-O3 -xSSE4.2 -no-prec-div`

C++ benchmarks:

126.lammps: `-O3 -xSSE4.2 -no-prec-div -ansi-alias`

Fortran benchmarks:

129.tera_tf: `-O3 -xSSE4.2 -no-prec-div`

137.lu: `basepeak = yes`

Continued on next page

Peak Optimization Flags (Continued)

143.dleslie: `basepeak = yes`

145.lGemsFDTD: `Same as 129.tera_tf`

Benchmarks using both Fortran and C:

121.pop2: `basepeak = yes`

128.GAPgeofem: `-O3 -xSSE4.2 -no-prec-div`

132.zeusmp2: `basepeak = yes`

147.l2wrf2: `Same as 128.GAPgeofem`

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

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 13:43:57 2014 by SPEC MPI2007 PS/PDF formatter v1463.
Originally published on 30 November 2011.