SPEC® MPIL2007 Result
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SGI

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

$SPECmpiL\_peak2007 =$ 66.8

$SPECmpiL\_base2007 =$ 49.3

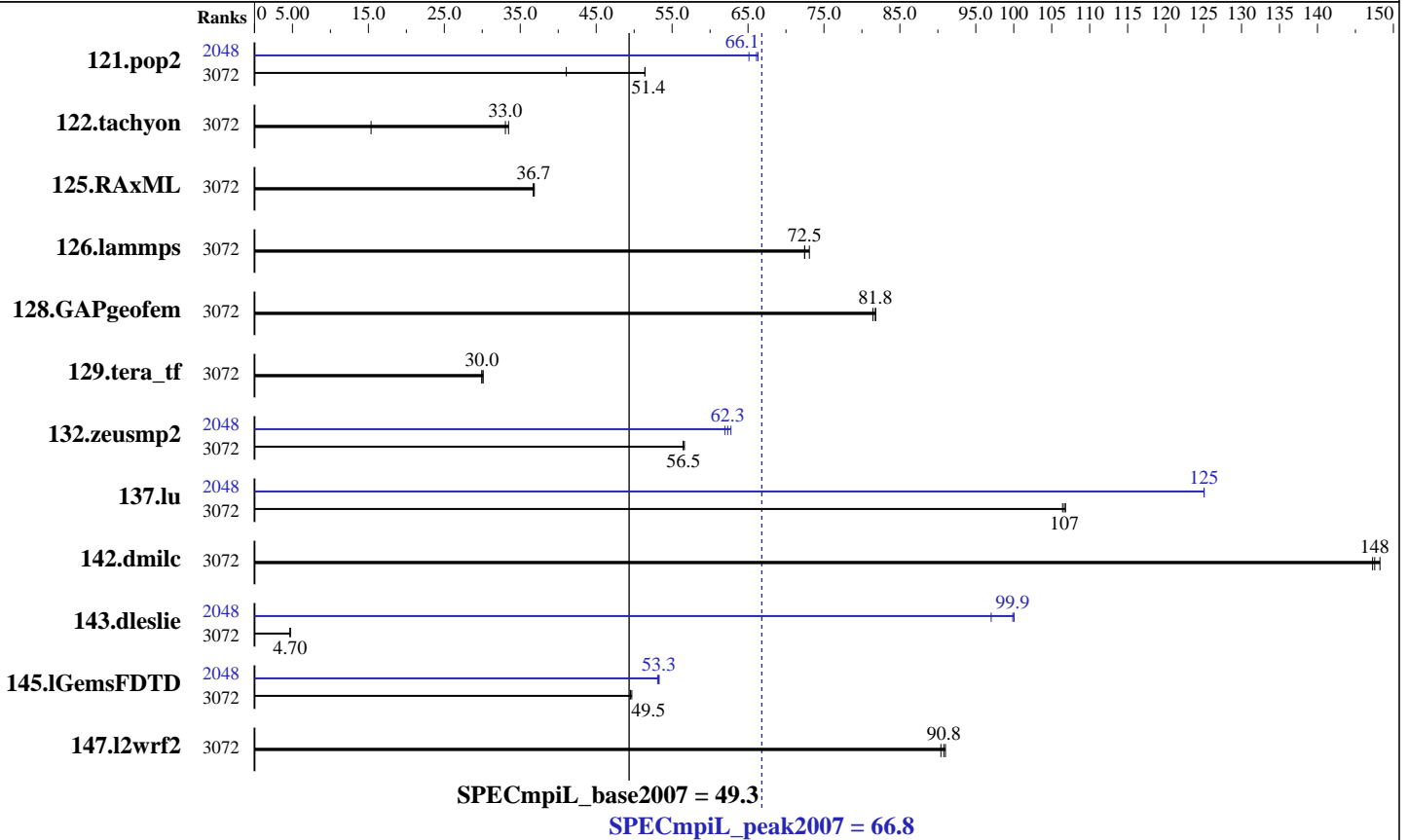|	
MPI2007 license: 4	**Test date:** Jun-2011
Test sponsor: SGI	**Hardware Availability:** Feb-2011
Tested by: SGI	**Software Availability:** Aug-2011

SPECmpiL_base2007 = 49.3
SPECmpiL_peak2007 = 66.8

Results Table

	Base						**Peak**						
Benchmark	**Ranks**	**Seconds**	**Ratio**	**Seconds**	**Ratio**	**Seconds**	**Ratio**	**Ranks**	**Seconds**	**Ratio**	**Seconds**	**Ratio**	**Seconds**	**Ratio**
121.pop2	3072	94.7	41.1	75.6	51.4	**75.7**	**51.4**	2048	59.7	65.1	**58.8**	**66.1**	58.7	66.3
122.tachyon	3072	127	15.4	58.1	33.5	**58.8**	**33.0**	3072	127	15.4	58.1	33.5	**58.8**	**33.0**
125.RAxML	3072	79.2	36.9	**79.5**	**36.7**	79.5	36.7	3072	79.2	36.9	**79.5**	**36.7**	79.5	36.7
126.lammps	3072	33.6	73.1	33.9	72.4	**33.9**	**72.5**	3072	33.6	73.1	33.9	72.4	**33.9**	**72.5**
128.GAPgeofem	3072	72.5	81.8	72.9	81.5	**72.6**	**81.8**	3072	72.5	81.8	72.9	81.5	**72.6**	**81.8**
129.tera_tf	3072	**36.7**	**30.0**	36.5	30.1	36.7	29.9	3072	**36.7**	**30.0**	36.5	30.1	36.7	29.9
132.zeusmp2	3072	37.6	56.4	**37.5**	**56.5**	37.4	56.6	2048	34.2	61.9	33.8	62.8	**34.0**	**62.3**
137.lu	3072	39.3	107	**39.4**	**107**	39.5	106	2048	**33.6**	**125**	33.6	125	33.6	125
142.dmilc	3072	24.9	148	25.0	147	**25.0**	**148**	3072	24.9	148	25.0	147	**25.0**	**148**
143.dleslie	3072	**660**	**4.70**	660	4.70	660	4.70	2048	31.0	100	**31.0**	**99.9**	32.0	97.0
145.lGemsFDTD	3072	**89.1**	**49.5**	89.1	49.5	88.8	49.7	2048	**82.8**	**53.3**	82.8	53.3	83.1	53.1
147.l2wrf2	3072	**90.4**	**90.8**	90.2	91.0	90.7	90.4	3072	**90.4**	**90.8**	90.2	91.0	90.7	90.4

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

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MPI2007 license:	4	**Test date:**	Jun-2011
Test sponsor:	SGI	**Hardware Availability:**	Feb-2011
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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 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++ 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:	256
Uses of the node:	compute
Vendor:	SGI
Model:	SGI Altix ICE 8400EX (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-1.4.2
Adapter Firmware:	2.7.8200
Operating System:	SUSE Linux Enterprise Server 11 SP1, Kernel 2.6.32.13-0.4-default
Local File System:	NFSv3
Shared File System:	NFSv3 IPoIB
System State:	Multi-user, run level 3
Other Software:	SGI ProPack 7SP1 for Linux, Build 701r3.sles11-1005252113 SGI Tempo Compute Node 2.1, Build 701r3.sles11-1005252113

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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:	64
Number of Ports:	36
Data Rate:	InfiniBand 4x QDR
Firmware:	5040005
Topology:	Enhanced Hypercube
Primary Use:	MPI and I/O traffic

Software

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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_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 base run, 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,
   and 64 switches for 3072 ranks.

 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.
```

Compiler Invocation

C benchmarks:
```
     icc
```

C++ benchmarks:

```
     126.lammps: icpc
```

Fortran benchmarks:
```
     ifort
```

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Compiler Invocation (Continued)

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:

        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 -xSSE4.2 -no-prec-div`

        143.dleslie: `Same as 137.lu`

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Peak Optimization Flags (Continued)

145.lGemsFDTD: Same as 137.lu

Benchmarks using both Fortran and C:

121.pop2: `-O3 -xSSE4.2 -no-prec-div`

128.GAPgeofem: basepeak = yes

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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