



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

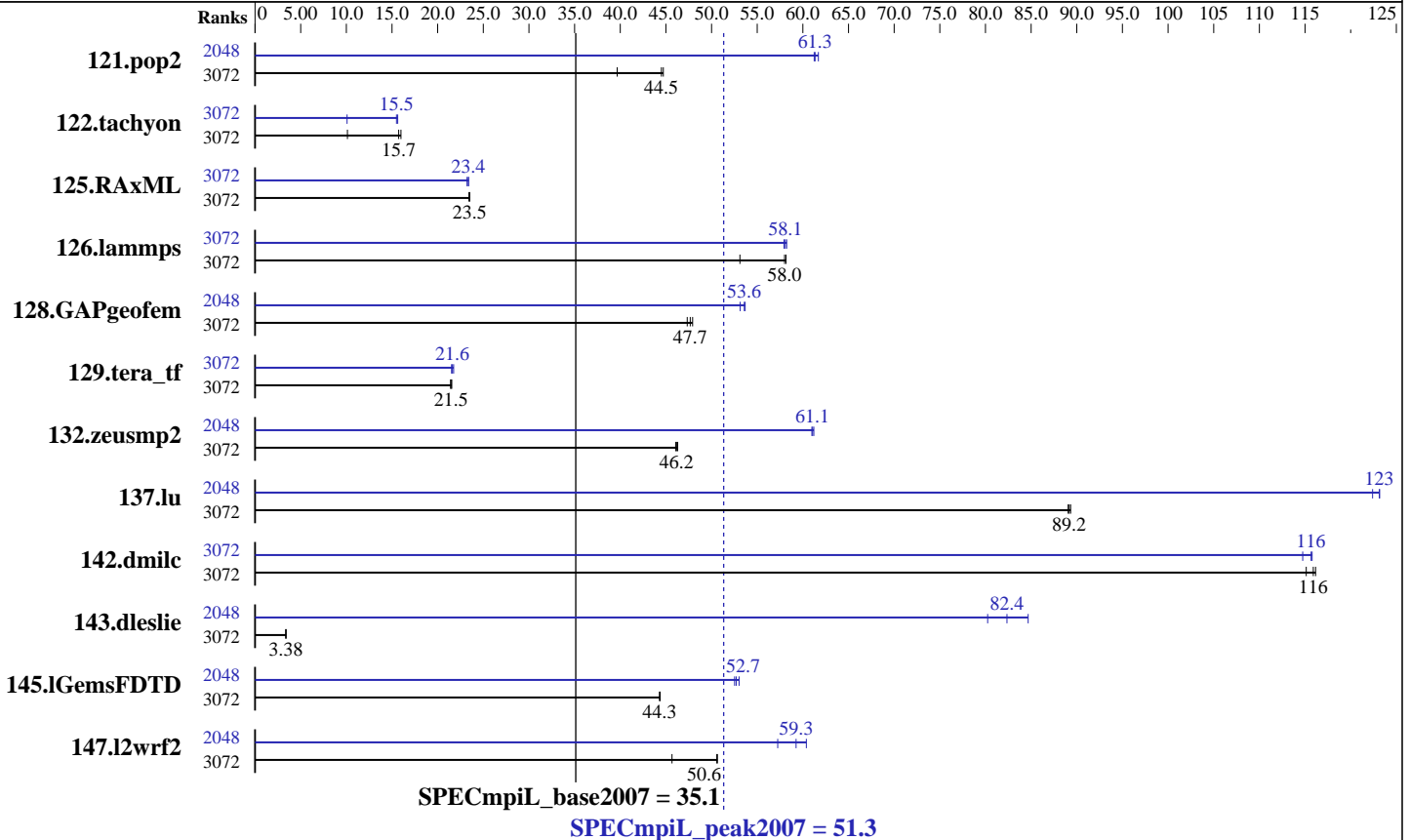
Test sponsor: SGI

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.

Standard Performance Evaluation Corporation

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http://www.spec.org/



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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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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



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Software Availability: Feb-2010

Interconnect Description: InfiniBand (I/O)

Hardware		Software
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	

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

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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



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The flags file that was used to format this result can be browsed at

http://www.spec.org/mpi2007/flags/SGI_x86_64_Intel1111_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_Intel1111_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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