



SPEC[®] MPIL2007 Result

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SGI

SGI ICE XA
(Intel Xeon E5-2690 v4, 2.6 GHz)

SPECmpiL_peak2007 = 109

SPECmpiL_base2007 = 105

MPI2007 license: 14

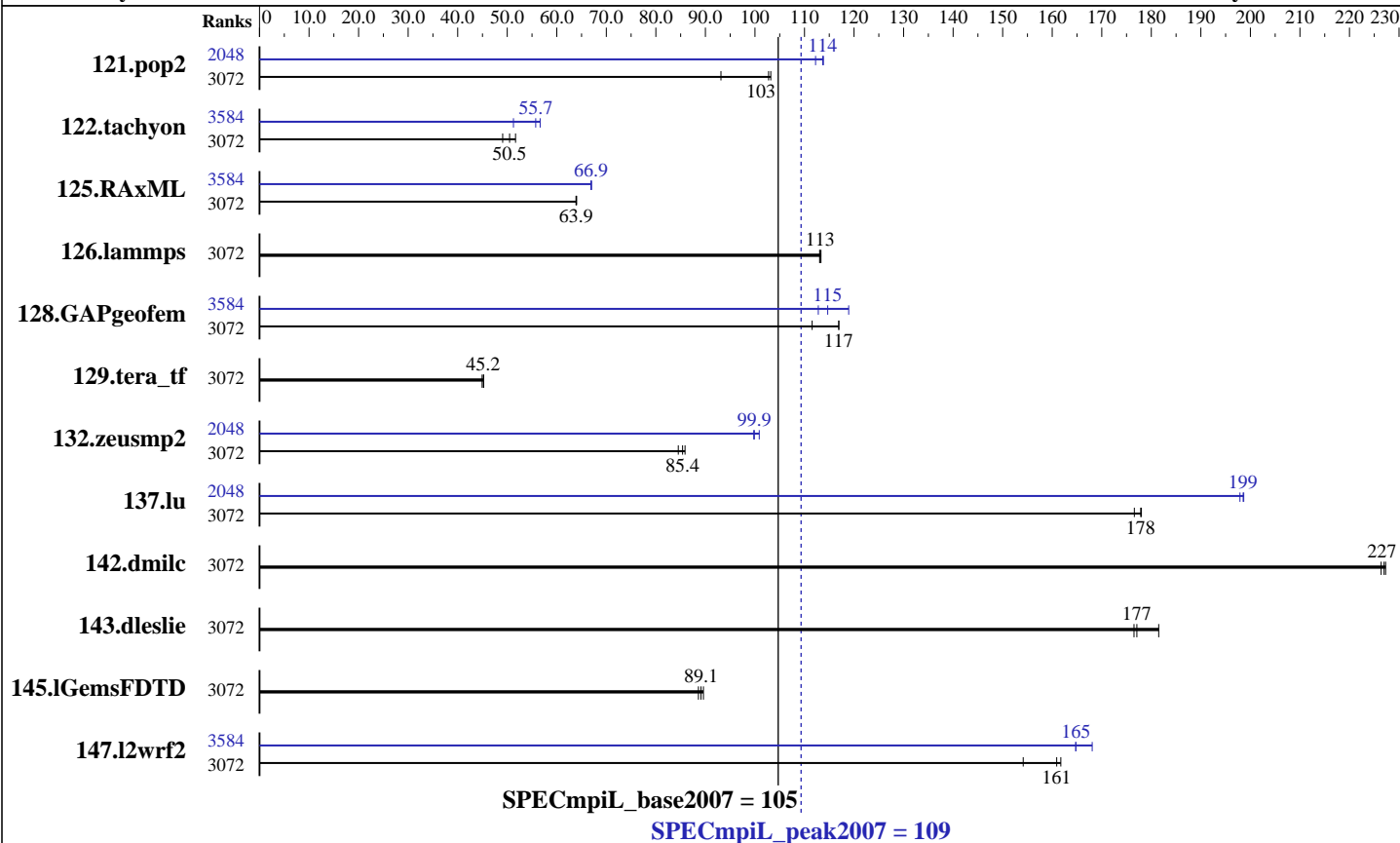
Test sponsor: SGI

Tested by: SGI

Test date: Jun-2016

Hardware Availability: May-2016

Software Availability: Jun-2016



Results Table

Benchmark	Base								Peak							
	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio		
121.pop2	3072	41.8	93.1	37.7	103	37.9	103	2048	34.7	112	34.2	114	34.2	114		
122.tachyon	3072	39.6	49.1	38.5	50.5	37.6	51.7	3584	37.9	51.3	34.9	55.7	34.3	56.6		
125.RAxML	3072	45.7	63.9	45.6	64.0	45.7	63.9	3584	43.6	66.9	43.6	67.0	43.6	66.9		
126.lammps	3072	21.7	113	21.8	113	21.7	113	3072	21.7	113	21.8	113	21.7	113		
128.GAPgeofem	3072	53.2	112	50.7	117	50.8	117	3584	51.7	115	49.9	119	52.6	113		
129.tera_tf	3072	24.5	44.9	24.3	45.2	24.3	45.2	3072	24.5	44.9	24.3	45.2	24.3	45.2		
132.zeusmp2	3072	24.8	85.4	24.7	85.9	25.1	84.5	2048	21.2	99.9	21.3	99.8	21.0	101		
137.lu	3072	23.8	177	23.6	178	23.6	178	2048	21.2	199	21.2	199	21.2	198		
142.dmilc	3072	16.3	226	16.2	227	16.2	227	3072	16.3	226	16.2	227	16.2	227		
143.dleslie	3072	17.6	177	17.1	181	17.5	177	3072	17.6	177	17.1	181	17.5	177		
145.lGemsFDTD	3072	49.8	88.6	49.5	89.1	49.2	89.6	3072	49.8	88.6	49.5	89.1	49.2	89.6		
147.l2wrf2	3072	51.0	161	53.2	154	50.7	162	3584	49.8	165	48.8	168	49.8	165		

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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Hardware Summary

Software Summary

Type of System: Homogeneous
 Compute Node: SGI ICE XA IP-125 CS
 Interconnect: InfiniBand (MPI and I/O)
 File Server Node: SGI MIS Server
 Total Compute Nodes: 128
 Total Chips: 256
 Total Cores: 3584
 Total Threads: 7168
 Total Memory: 16 TB
 Base Ranks Run: 3072
 Minimum Peak Ranks: 2048
 Maximum Peak Ranks: 3584

C Compiler: Intel C++ Composer XE 2016 for Linux, Version 16.0.3.210 Build 20160415
 C++ Compiler: Intel C++ Composer XE 2016 for Linux Version 16.0.3.210 Build 20160405
 Fortran Compiler: Intel Fortran Composer XE 2016 for Linux, Version 16.0.3.210 Build 20160405
 Base Pointers: 64-bit
 Peak Pointers: 64-bit
 MPI Library: SGI MPT 2.14 Patch 11333
 Other MPI Info: OFED 3.2.2
 Pre-processors: None
 Other Software: None

Node Description: SGI ICE XA IP-125 CS

Hardware

Software

Number of nodes: 128
 Uses of the node: compute
 Vendor: SGI
 Model: SGI ICE XA (Intel Xeon E5-2690 v4, 2.6 GHz)
 CPU Name: Intel Xeon E5-2690 v4
 CPU(s) orderable: 1-2 chips
 Chips enabled: 2
 Cores enabled: 28
 Cores per chip: 14
 Threads per core: 2
 CPU Characteristics: 14 Core, 2.60 GHz, 9.6 GT/s QPI
 Intel Turbo Boost Technology up to 3.50 GHz
 Hyper-Threading Technology enabled
 CPU MHz: 2600
 Primary Cache: 32 KB I + 32 KB D on chip per core
 Secondary Cache: 256 KB I+D on chip per core
 L3 Cache: 35 MB I+D on chip per chip
 Other Cache: None
 Memory: 128 GB (8 x 16 GB 2Rx4 PC4-2400T-R)
 Disk Subsystem: None
 Other Hardware: None
 Adapter: Mellanox MT27700 with ConnectX-4 ASIC (PCIe x16 Gen3 8 GT/s)
 Number of Adapters: 2
 Slot Type: PCIe x16 Gen3
 Data Rate: InfiniBand 4X EDR
 Ports Used: 1
 Interconnect Type: InfiniBand

Adapter: Mellanox MT27700 with ConnectX-4 ASIC (PCIe x16 Gen3 8 GT/s)
 Adapter Driver: OFED-3.2.1.5.3
 Adapter Firmware: 12.14.0114
 Operating System: SUSE Linux Enterprise Server 11 SP4 (x86_64), Kernel 3.0.101-71.1.10690.1.PTF-default
 Local File System: NFSv3
 Shared File System: NFSv3 IPoIB
 System State: Multi-user, run level 3
 Other Software: SGI Tempo Compute Node 3.3.0, Build 714r18.sles11sp4-1604041900



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Software Availability: Jun-2016

Node Description: SGI MIS Server

Hardware		Software	
Number of nodes:	1	Adapter:	Mellanox MT27500 with ConnectX-3 ASIC
Uses of the node:	fileserver	Adapter Driver:	OFED-3.2.0.1.1
Vendor:	SGI	Adapter Firmware:	2.36.5000
Model:	SGI MIS Server	Operating System:	SUSE Linux Enterprise Server 11 (x86_64), Kernel 3.0.101-0.46-default
CPU Name:	Intel Xeon E5-2670	Local File System:	xfs
CPU(s) orderable:	1-2 chips	Shared File System:	--
Chips enabled:	2	System State:	Multi-user, run level 3
Cores enabled:	16	Other Software:	SGI Foundation Software 2.9, Build 711r2.sles11sp3-1411192056
Cores per chip:	8		
Threads per core:	1		
CPU Characteristics:	Intel Turbo Boost Technology up to 3.30 GHz Hyper-Threading Technology disabled		
CPU MHz:	1200		
Primary Cache:	32 KB I + 32 KB D on chip per core		
Secondary Cache:	256 KB I+D on chip per core		
L3 Cache:	20 MB I+D on chip per chip		
Other Cache:	None		
Memory:	128 GB (12 * 8 GB 2Rx4 PC3-12800R-11, ECC)		
Disk Subsystem:	45 TB RAID 6 8 x 6+2 900GB (WD, 10K RPM)		
Other Hardware:	None		
Adapter:	Mellanox MT27500 with ConnectX-3 ASIC		
Number of Adapters:	2		
Slot Type:	PCIe x8 Gen3		
Data Rate:	InfiniBand 4X FDR		
Ports Used:	2		
Interconnect Type:	InfiniBand		

Interconnect Description: InfiniBand (MPI and I/O)

Hardware		Software
Vendor:	Mellanox Technologies and SGI	
Model:	None	
Switch Model:	SGI P0002145	
Number of Switches:	30	
Number of Ports:	36	
Data Rate:	InfiniBand 4x EDR	
Firmware:	11.0350.0394	
Topology:	Enhanced Hypercube	
Primary Use:	MPI and I/O traffic	



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Submit Notes

The config file option 'submit' was used.

General Notes

Software environment:

```
export MPI_REQUEST_MAX=65536
export MPI_TYPE_MAX=32768
export MPI_IB_RAILS=2
export MPI_IB_UPGRADE_SENDS=50
export MPI_IB_IMM_UPGRADE=false
export MPI_IB_DCIS=2
export MPI_CONNECTIONS_THRESHOLD=0
export MPI_IB_MTU=4096
ulimit -s unlimited
```

BIOS settings:

```
AMI BIOS version HA012036
Hyper-Threading Technology enabled
Intel Turbo Boost Technology enabled (default)
Transparent Hugepages Enabled
```

Job Placement:

Each MPI job was assigned to a topologically compact set of nodes. The base run used 12 ranks per socket and peak runs varied between 8 and 14 ranks per socket. The total number of sockets and nodes used was constant.

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

Benchmarks using both Fortran and C:

icc ifort



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Portability Flags

121.pop2: -DSPEC_MPI_CASE_FLAG

Base Optimization Flags

C benchmarks:

-O3 -xCORE-AVX2 -no-prec-div

C++ benchmarks:

126.lammps: -O3 -xCORE-AVX2 -no-prec-div -ansi-alias

Fortran benchmarks:

-O3 -xCORE-AVX2 -no-prec-div

Benchmarks using both Fortran and C:

-O3 -xCORE-AVX2 -no-prec-div

Peak Optimization Flags

C benchmarks:

122.tachyon: -O3 -xCORE-AVX2 -no-prec-div

125.RAxML: Same as 122.tachyon

142.dmilc: basepeak = yes

C++ benchmarks:

126.lammps: basepeak = yes

Fortran benchmarks:

129.tera_tf: basepeak = yes

137.lu: -O3 -xCORE-AVX2 -no-prec-div

143.dleslie: basepeak = yes

145.lGemsFDTD: basepeak = yes

Benchmarks using both Fortran and C:

-O3 -xCORE-AVX2 -no-prec-div



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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_Intel14_flags.20140908.html

You can also download the XML flags source by saving the following link:

http://www.spec.org/mpi2007/flags/SGI_x86_64_Intel14_flags.20140908.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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