



SPEC[®] MPIL2007 Result

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SGI

SGI Rackable C2112-4GP3
(Intel Xeon E5-2699 v4, 2.20 GHz)

SPECmpiL_peak2007 = Not Run

SPECmpiL_base2007 = 6.93

MPI2007 license: 14

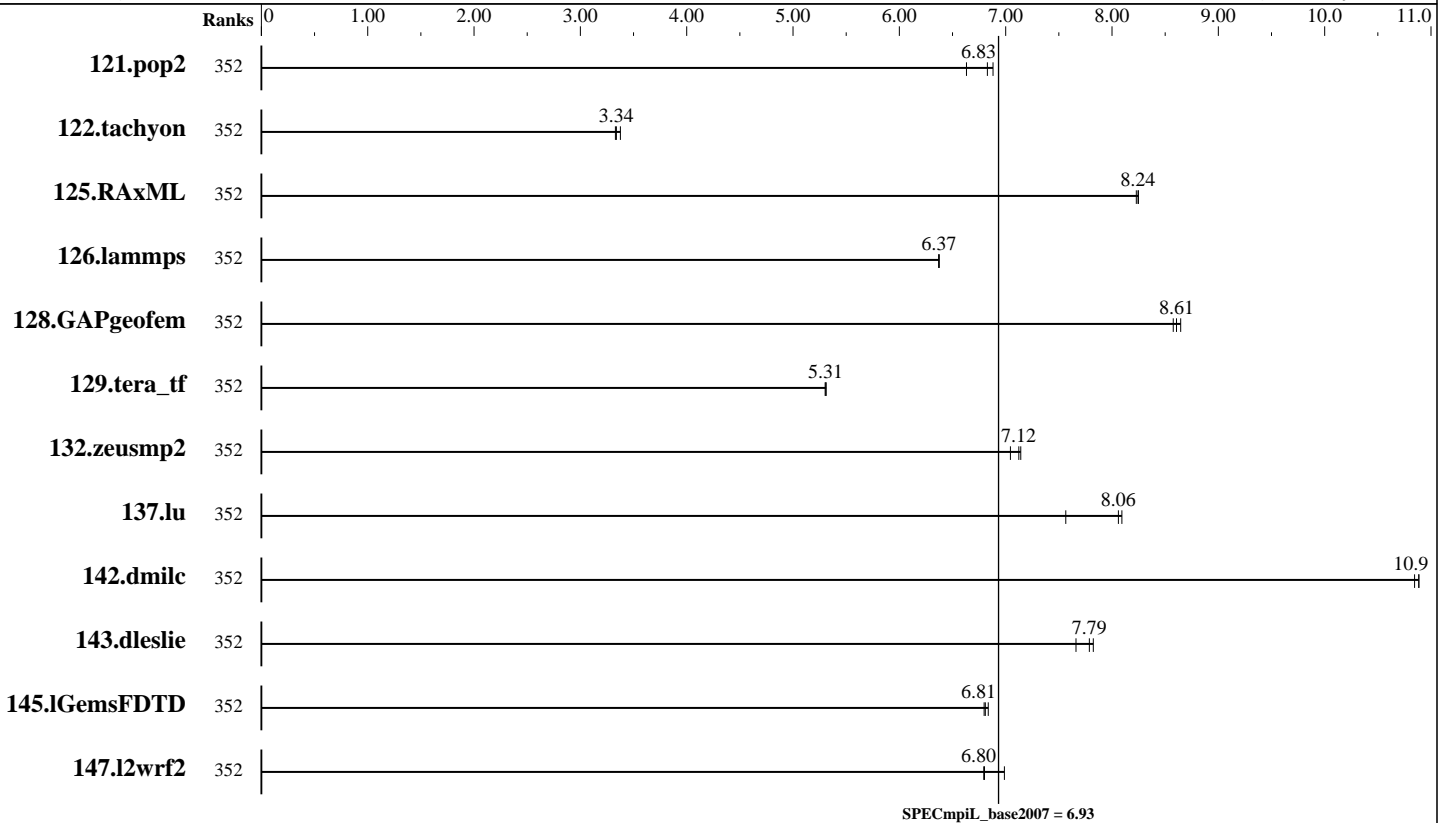
Test sponsor: SGI

Tested by: SGI

Test date: Mar-2016

Hardware Availability: Mar-2016

Software Availability: May-2016



Results Table

Benchmark	Base							Peak						
	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
121.pop2	352	587	6.63	565	6.88	<u>570</u>	<u>6.83</u>							
122.tachyon	352	576	3.38	<u>582</u>	<u>3.34</u>	584	3.33							
125.RAxML	352	354	8.25	355	8.23	<u>354</u>	<u>8.24</u>							
126.lammps	352	<u>386</u>	<u>6.37</u>	386	6.37	386	6.37							
128.GAPgeofem	352	<u>689</u>	<u>8.61</u>	692	8.58	686	8.65							
129.tera_tf	352	207	5.30	<u>207</u>	<u>5.31</u>	207	5.31							
132.zeusmp2	352	297	7.14	301	7.04	<u>298</u>	<u>7.12</u>							
137.lu	352	555	7.57	519	8.09	<u>521</u>	<u>8.06</u>							
142.dmilc	352	<u>338</u>	<u>10.9</u>	340	10.8	338	10.9							
143.dleslie	352	<u>398</u>	<u>7.79</u>	396	7.82	405	7.66							
145.lGemsFDTD	352	<u>648</u>	<u>6.81</u>	649	6.80	645	6.84							
147.l2wrf2	352	1174	6.99	<u>1206</u>	<u>6.80</u>	1208	6.79							

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 Rackable C2112-4GP3 Compute Node
Interconnects: InfiniBand MPI
InfiniBand I/O
File Server Node: SGI MIS Server
Total Compute Nodes: 4
Total Chips: 8
Total Cores: 176
Total Threads: 352
Total Memory: 512 GB
Base Ranks Run: 352
Minimum Peak Ranks: --
Maximum Peak Ranks: --

Software Summary

C Compiler: Intel C++ Composer XE 2013 for Linux, Version 14.0.3.174 Build 20140422
C++ Compiler: Intel C++ Composer XE 2013 for Linux, Version 14.0.3.174 Build 20140422
Fortran Compiler: Intel Fortran Composer XE 2013 for Linux, Version 14.0.3.174 Build 20140422
Base Pointers: 64-bit
Peak Pointers: Not Applicable
MPI Library: SGI MPT 2.14
Other MPI Info: MLNX_OFED_LINUX-3.1-1.0.3
Pre-processors: None
Other Software: None

Node Description: SGI Rackable C2112-4GP3 Compute Node

Hardware

Number of nodes: 4
Uses of the node: compute
Vendor: SGI
Model: SGI Rackable C2112-4GP3 (Intel Xeon E5-2699 v4, 2.20 GHz)
CPU Name: Intel Xeon E5-2699 v4
CPU(s) orderable: 1-2 chips
Chips enabled: 2
Cores enabled: 44
Cores per chip: 22
Threads per core: 2
CPU Characteristics: 22 Core, 2.20 GHz, 9.6 GT/s QPI
Intel Turbo Boost Technology up to 3.60 GHz
Hyper-Threading Technology enabled
2220
CPU MHz:
Primary Cache: 32 KB I + 32 KB D on chip per core
Secondary Cache: 256 KB I+D on chip per core
L3 Cache: 55 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 MT27620 with ConnectX-4 (PCIe x16 Gen3 8 GT/s)
Number of Adapters: 1
Slot Type: PCIe x16 Gen3
Data Rate: InfiniBand 4x EDR
Ports Used: 1
Interconnect Type: InfiniBand
Adapter: Mellanox MT27500 with ConnectX-3 (PCIe x8 Gen3 8 GT/s)
Number of Adapters: 1
Slot Type: PCIe x8 Gen3
Data Rate: InfiniBand 4x FDR

Software

Adapter: Mellanox MT27620 with ConnectX-4 (PCIe x16 Gen3 8 GT/s)
Adapter Driver: OFED-3.1.1-0.3
Adapter Firmware: 12.12.1240
Adapter: Mellanox MT27500 with ConnectX-3 (PCIe x8 Gen3 8 GT/s)
Adapter Driver: OFED-3.1.1-0.0
Adapter Firmware: 2.35.5100
Operating System: SUSE Linux Enterprise Server 12 (x86_64), Kernel 3.12.44-52.10-default
Local File System: ext3
Shared File System: NFSv3 IPoIB
System State: Multi-user, run level 3
Other Software: SGI Tempo Service Node 3.2.0, Build 713r26.sles12-1510192000

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Node Description: SGI Rackable C2112-4GP3 Compute Node

Ports Used: 1
Interconnect Type: InfiniBand

Node Description: SGI MIS Server

Hardware

Number of nodes: 1
Uses of the node: fileserver
Vendor: SGI
Model: SGI MIS Server (Intel Xeon X2670, 2.60 GHz)
CPU Name: Intel Xeon E5-2670
CPU(s) orderable: 1-2 chips
Chips enabled: 2
Cores enabled: 16
Cores per chip: 8
Threads per core: 2
CPU Characteristics: Intel Turbo Boost Technology up to 3.30 GHz
Hyper-Threading Technology enabled
CPU MHz: 2601
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 (8 * 16 GB 2Rx4 PC3-10600R-9, ECC)
Disk Subsystem: 45 TB RAID 6
12 x 1 TB SATA (Seagate Constellation, 7200RPM)
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

Software

Adapter: Mellanox MT27500 with ConnectX-3 ASIC
Adapter Driver: MLNX_OFED_LINUX-3.1-1.0.3
Adapter Firmware: 2.35.5100
Operating System: SUSE Linux Enterprise Server 11 SP3 (x86_64),
Kernel 3.0.101-0.46-default
Local File System: xfs
Shared File System: --
System State: Multi-user, run level 5
Other Software: SGI Foundation Software 2.10
Build 710r16.sles11sp3-1404092103

Interconnect Description: InfiniBand MPI

Hardware

Vendor: Mellanox Technologies
Model: None
Switch Model: Mellanox SB7790
Number of Switches: 6
Number of Ports: 36
Data Rate: InfiniBand 4x EDR
Firmware: 11.1.102
Topology: Fat Tree
Primary Use: MPI traffic

Software



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Interconnect Description: InfiniBand I/O

Hardware		Software
Vendor:	Mellanox Technologies	
Model:	None	
Switch Model:	Mellanox MSX6036F-1SFS	
Number of Switches:	2	
Number of Ports:	36	
Data Rate:	InfiniBand 4x FDR	
Firmware:	9.3.5080	
Switch Model:	Mellanox MSX6025	
Number of Switches:	4	
Number of Ports:	36	
Data Rate:	InfiniBand 4x FDR	
Firmware:	9.3.6000	
Topology:	Fat Tree	
Primary Use:	I/O traffic	

Submit Notes

The config file option 'submit' was used.

General Notes

130.socorro (base): "nullify_ptrs" src.alt was used.

129.tera_tf (base): "add_rank_support" src.alt was used.

```
Software environment:
export MPI_REQUEST_MAX=65536
export MPI_TYPE_MAX=32768
export MPI_IB_DEVS=1
export MPI_CONNECTIONS_THRESHOLD=0
export MPI_IB_UPGRADE_SENDS=50
export MPI_IB_IMM_UPGRADE=false
export MPI_IB_HYPER_LAZY=false
ulimit -s unlimited
```

```
BIOS settings:
AMI BIOS version T20151001184140
Hyper-Threading Technology enabled
Transparent HugePages enabled
Intel Turbo Boost Technology enabled (default)
Intel Turbo Boost Technology activated with
modprobe acpi_cpufreq
cpupower frequency-set -u 2601MHz -d 2601MHz -g performance
```

```
Job Placement:
Each MPI job was assigned to a topologically compact set
of nodes, i.e. the minimal needed number of leaf switches
```

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General Notes (Continued)

was used for each job: 1 switch for up to 32 sockets, and 2 switches for up to 64 sockets.

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 is restricted to the other plane.

Base Compiler Invocation

C benchmarks:

icc

C++ benchmarks:

126.lammps: icpc

Fortran benchmarks:

ifort

Benchmarks using both Fortran and C:

icc ifort

Base 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



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Base 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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