



# SPEC® MPIL2007 Result

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## SGI

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

SPECmpiL\_peak2007 = Not Run

SPECmpiL\_base2007 = 44.8

MPI2007 license: 14

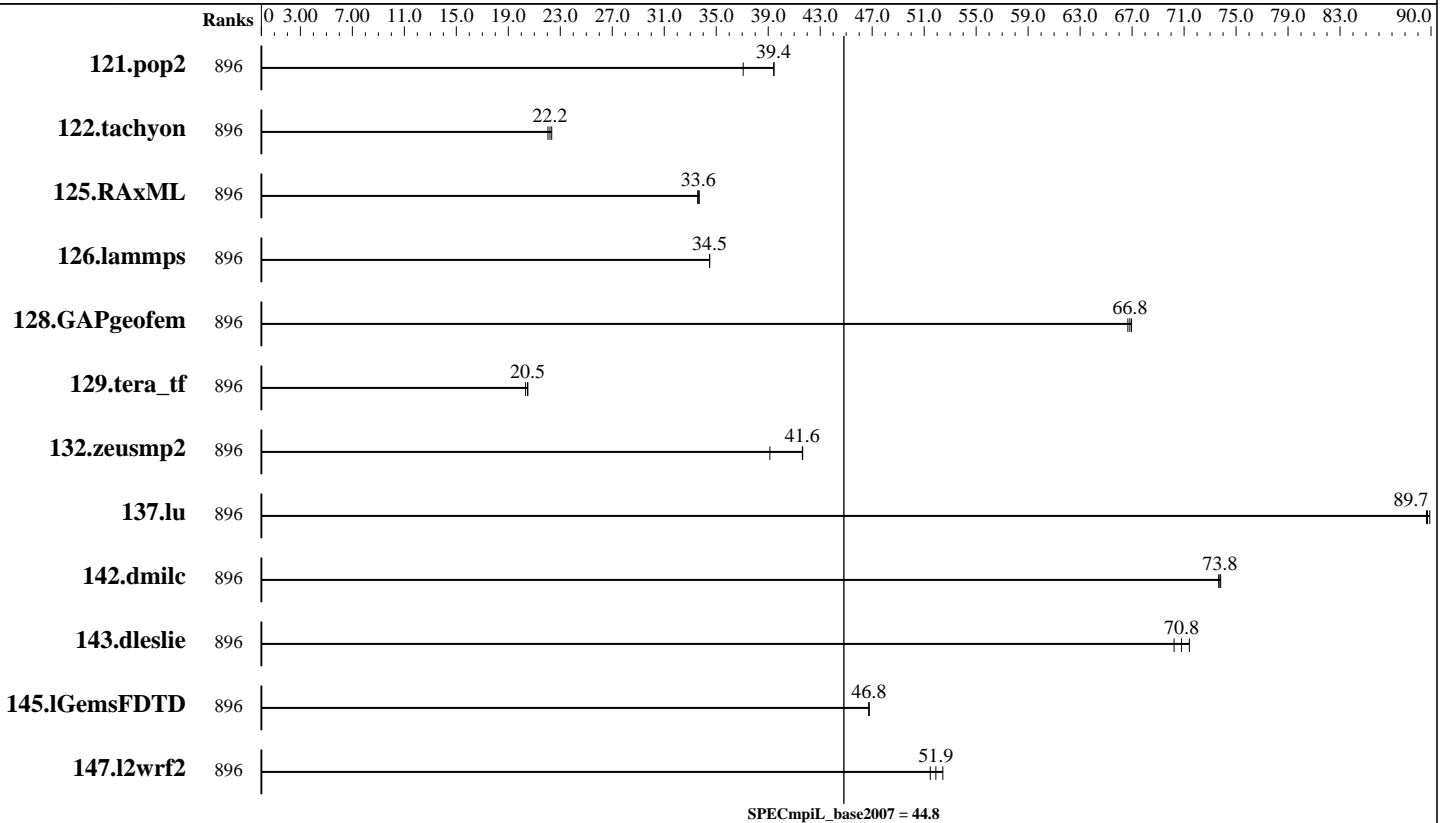
Test sponsor: SGI

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	896	105	37.1	<u>98.7</u>	<u>39.4</u>	98.6	39.5							
122.tachyon	896	88.2	22.1	87.0	22.3	<u>87.5</u>	<u>22.2</u>							
125.RAxML	896	<u>86.8</u>	<u>33.6</u>	86.6	33.7	86.9	33.6							
126.lammps	896	71.3	34.5	71.3	34.5	<u>71.3</u>	<u>34.5</u>							
128.GAPgeofem	896	89.0	66.7	<u>88.8</u>	<u>66.8</u>	88.6	67.0							
129.tera_tf	896	54.1	20.3	<u>53.6</u>	<u>20.5</u>	53.6	20.5							
132.zeusmp2	896	54.2	39.1	50.9	41.7	<u>50.9</u>	<u>41.6</u>							
137.lu	896	<u>46.8</u>	<u>89.7</u>	46.9	89.7	46.7	89.9							
142.dmilc	896	<u>50.0</u>	<u>73.8</u>	49.9	73.8	50.0	73.7							
143.dleslie	896	<u>43.8</u>	<u>70.8</u>	43.4	71.4	44.1	70.2							
145.lGemsFDTD	896	<u>94.3</u>	<u>46.8</u>	94.4	46.7	94.3	46.8							
147.l2wrf2	896	159	51.5	156	52.4	<u>158</u>	<u>51.9</u>							

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

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: 32  
 Total Chips: 64  
 Total Cores: 896  
 Total Threads: 1792  
 Total Memory: 4 TB  
 Base Ranks Run: 896  
 Minimum Peak Ranks: --  
 Maximum Peak Ranks: --

### Software Summary

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 11328  
 Other MPI Info: OFED 3.2.2  
 Pre-processors: None  
 Other Software: None

## Node Description: SGI ICE XA IP-125 CS

### Hardware

Number of nodes: 32  
 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

### Software

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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### 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:	xf
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:	8	
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 with 14 ranks per socket.

### 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.

## 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



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## 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

## 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](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](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](mailto:webmaster@spec.org).

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