



SPEC[®] MPIM2007 Result

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SGI

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

SPECmpiM_peak2007 = Not Run

SPECmpiM_base2007 = 90.5

MPI2007 license: 14

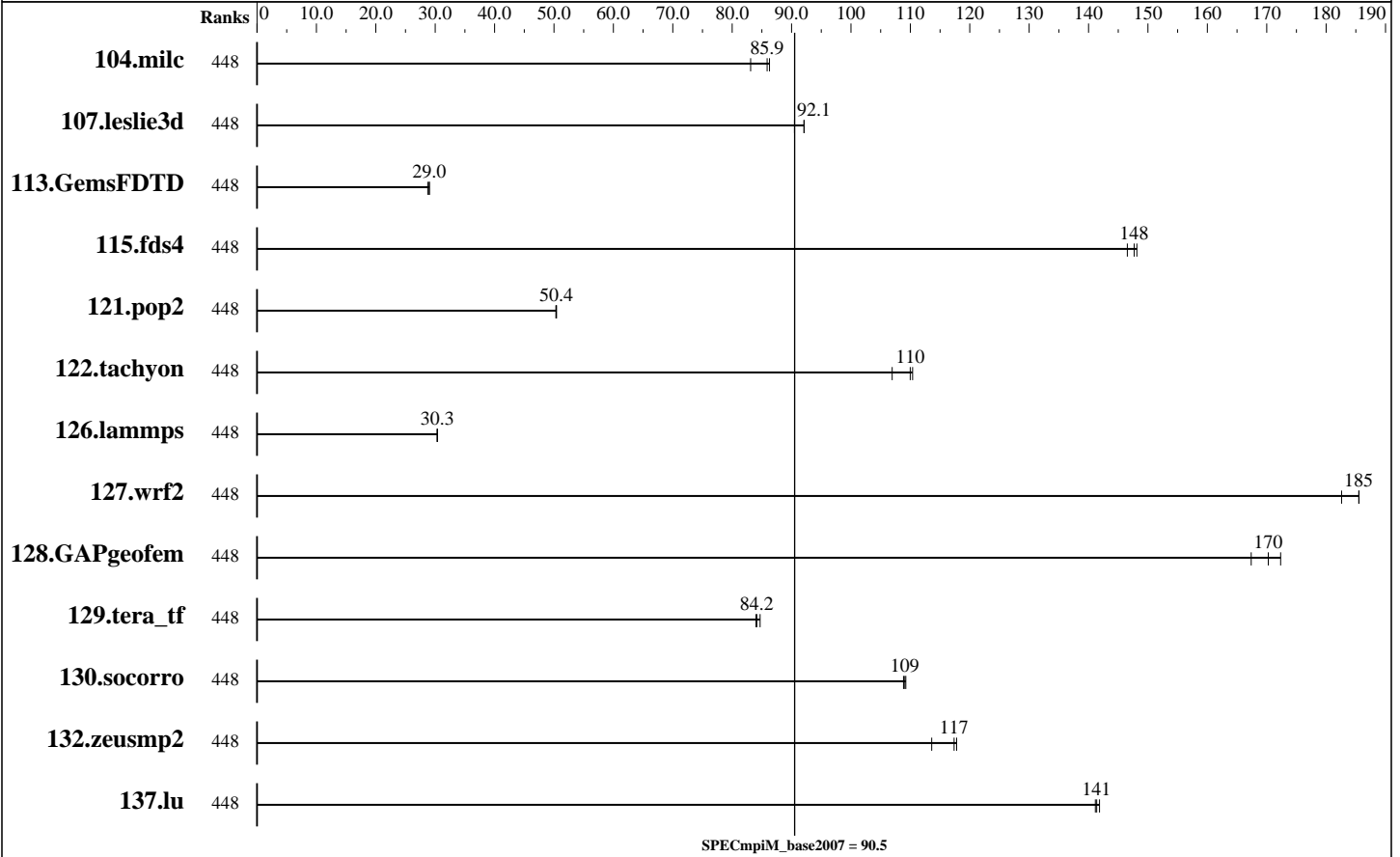
Test sponsor: SGI

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		
104.milc	448	18.8	83.1	<u>18.2</u>	<u>85.9</u>	18.1	86.3									
107.leslie3d	448	<u>56.7</u>	<u>92.1</u>	57.7	90.5	56.7	92.1									
113.GemsFDTD	448	217	29.0	219	28.8	<u>218</u>	<u>29.0</u>									
115.fds4	448	<u>13.2</u>	<u>148</u>	13.3	147	13.2	148									
121.pop2	448	82.0	50.3	<u>81.9</u>	<u>50.4</u>	81.9	50.4									
122.tachyon	448	25.3	110	<u>25.4</u>	<u>110</u>	26.2	107									
126.lammps	448	96.1	30.3	96.0	30.4	<u>96.1</u>	<u>30.3</u>									
127.wrf2	448	42.7	183	<u>42.0</u>	<u>185</u>	42.0	186									
128.GAPgeofem	448	12.3	167	<u>12.1</u>	<u>170</u>	12.0	172									
129.tera_tf	448	32.9	84.0	32.7	84.7	<u>32.9</u>	<u>84.2</u>									

Table continues on next page. Results appear in the order in which they were run. Bold underlined text indicates a median measurement.



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Results Table (Continued)

Benchmark	Base							Peak						
	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
130.socorro	448	<u>35.0</u>	<u>109</u>	35.1	109	34.9	109							
132.zeusmp2	448	27.3	114	<u>26.4</u>	<u>117</u>	26.3	118							
137.lu	448	<u>26.0</u>	<u>141</u>	26.0	141	25.9	142							

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

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: 16
 Total Chips: 32
 Total Cores: 448
 Total Threads: 448
 Total Memory: 2 TB
 Base Ranks Run: 448
 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: 16
 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: 1
 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

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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Software Availability: Jun-2016

Node Description: SGI ICE XA IP-125 CS

Data Rate: InfiniBand 4X EDR
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
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: 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

Software

Adapter: Mellanox MT27500 with ConnectX-3 ASIC
Adapter Driver: OFED-3.2.0.1.1
Adapter Firmware: 2.36.5000
Operating System: SUSE Linux Enterprise Server 11 (x86_64),
Kernel 3.0.101-0.46-default
Local File System: xfs
Shared File System: --
System State: Multi-user, run level 3
Other Software: SGI Foundation Software 2.9,
Build 711r2.sles11sp3-1411192056

Interconnect Description: InfiniBand (MPI and I/O)

Hardware

Vendor: Mellanox Technologies and SGI
Model: None
Switch Model: SGI P0002145
Number of Switches: 4
Number of Ports: 36
Data Rate: InfiniBand 4x EDR
Firmware: 11.0350.0394
Topology: Enhanced Hypercube

Software

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Interconnect Description: InfiniBand (MPI and I/O)

Primary Use: MPI and I/O traffic

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 disabled
Intel Turbo Boost Technology enabled (default)
Transparent Hugepages Enabled
```

Job Placement:

Each MPI job was assigned to a topologically compact set of nodes using 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



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Base Portability Flags

121.pop2: -DSPEC_MPI_CASE_FLAG
127.wrf2: -DSPEC_MPI_CASE_FLAG -DSPEC_MPI_LINUX
130.socorro: -assume nostd_intent_in

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

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.

Tested with SPEC MPI2007 v2.0.1.
Report generated on Fri Aug 19 11:45:41 2016 by SPEC MPI2007 PS/PDF formatter v1463.
Originally published on 19 August 2016.