SPEC® MPIM2007 Result

SGI

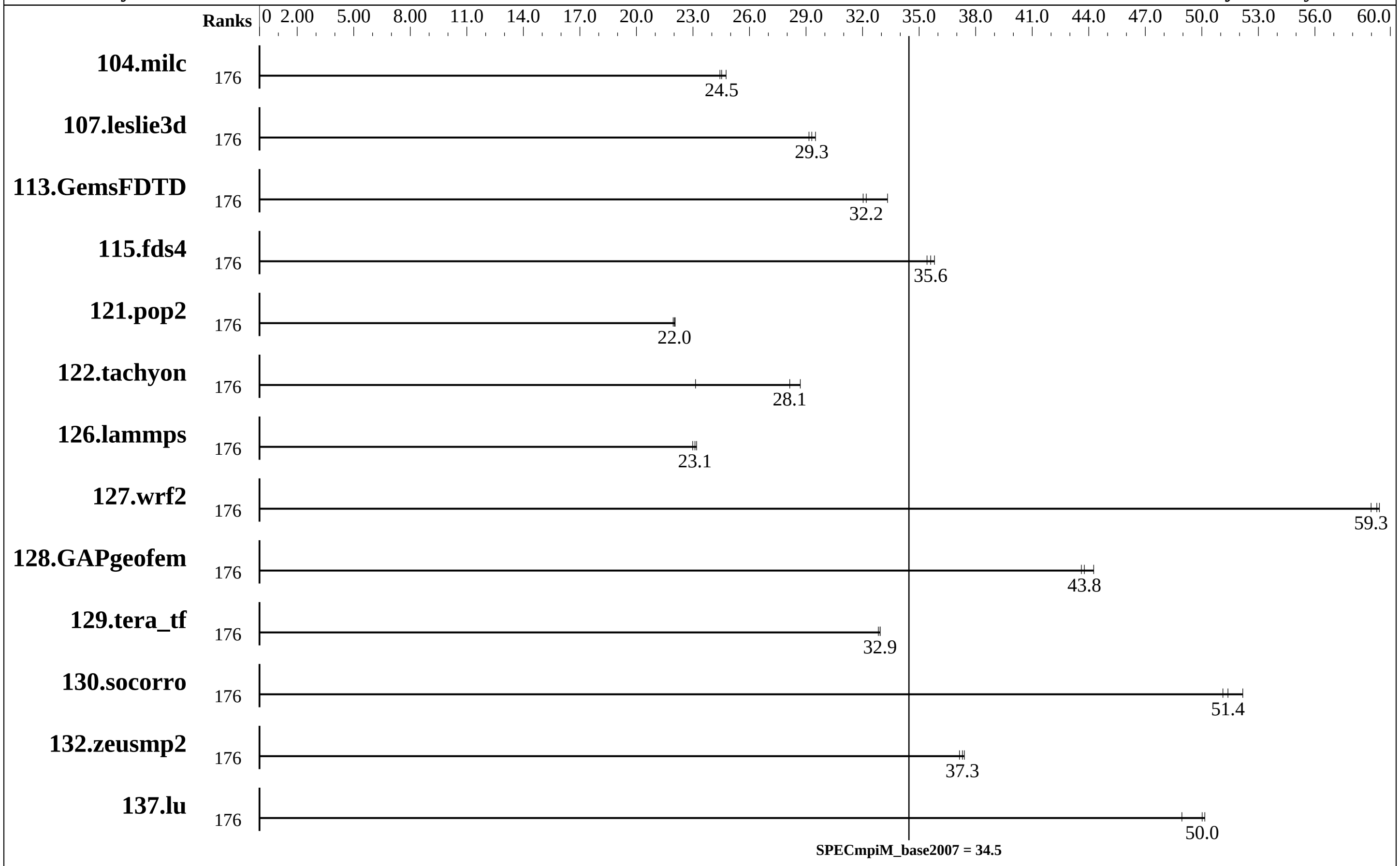
SGI Rackable C2112-4GP3
(Intel Xeon E5-2699 v4, 2.20 GHz)

SPECmpiM_peak2007 = Not Run

SPECmpiM_base2007 = 34.5

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
104.milc	176	64.1	24.4	63.2	24.8	**63.8**	**24.5**							
107.leslie3d	176	179	29.2	**178**	**29.3**	177	29.5							
113.GemsFDTD	176	189	33.3	**196**	**32.2**	197	32.0							
115.fds4	176	**54.8**	**35.6**	54.5	35.8	55.1	35.4							
121.pop2	176	187	22.1	**188**	**22.0**	188	22.0							
122.tachyon	176	97.5	28.7	**99.4**	**28.1**	121	23.1							
126.lammps	176	127	23.0	126	23.2	**126**	**23.1**							
127.wrf2	176	132	59.0	**132**	**59.3**	131	59.4							
128.GAPgeofem	176	46.7	44.3	47.4	43.6	**47.2**	**43.8**							
129.tera_tf	176	84.1	32.9	84.3	32.8	**84.1**	**32.9**							

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

Results Table (Continued)

Benchmark	Base							Peak						
	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
130.socorro	176	74.7	51.1	**74.3**	**51.4**	73.2	52.2							
132.zeusmp2	176	83.0	37.4	**83.2**	**37.3**	83.6	37.1							
137.lu	176	75.1	48.9	**73.5**	**50.0**	73.3	50.2							

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 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:	176
Total Memory:	512 GB
Base Ranks Run:	176
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:	1
CPU Characteristics:	22 Core, 2.20 GHz, 9.6 GT/s QPI Intel Turbo Boost Technology up to 3.60 GHz Hyper-Threading Technology disabled
CPU MHz:	2220
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)

Continued on next page

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

Node Description: SGI Rackable C2112-4GP3 Compute Node

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
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

Interconnect Description: InfiniBand I/O

Hardware

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

Software

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
```

Continued on next page

General Notes (Continued)

```
    export MPI_IB_HYPER_LAZY=false
    ulimit -s unlimited

  BIOS settings:
    AMI BIOS version T20151001184140
    Hyper-Threading Technology disabled
    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
    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
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

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 Thu Mar 31 11:05:40 2016 by SPEC MPI2007 PS/PDF formatter v1463.
Originally published on 31 March 2016.