SPEC® MPIM2007 Result

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SGI

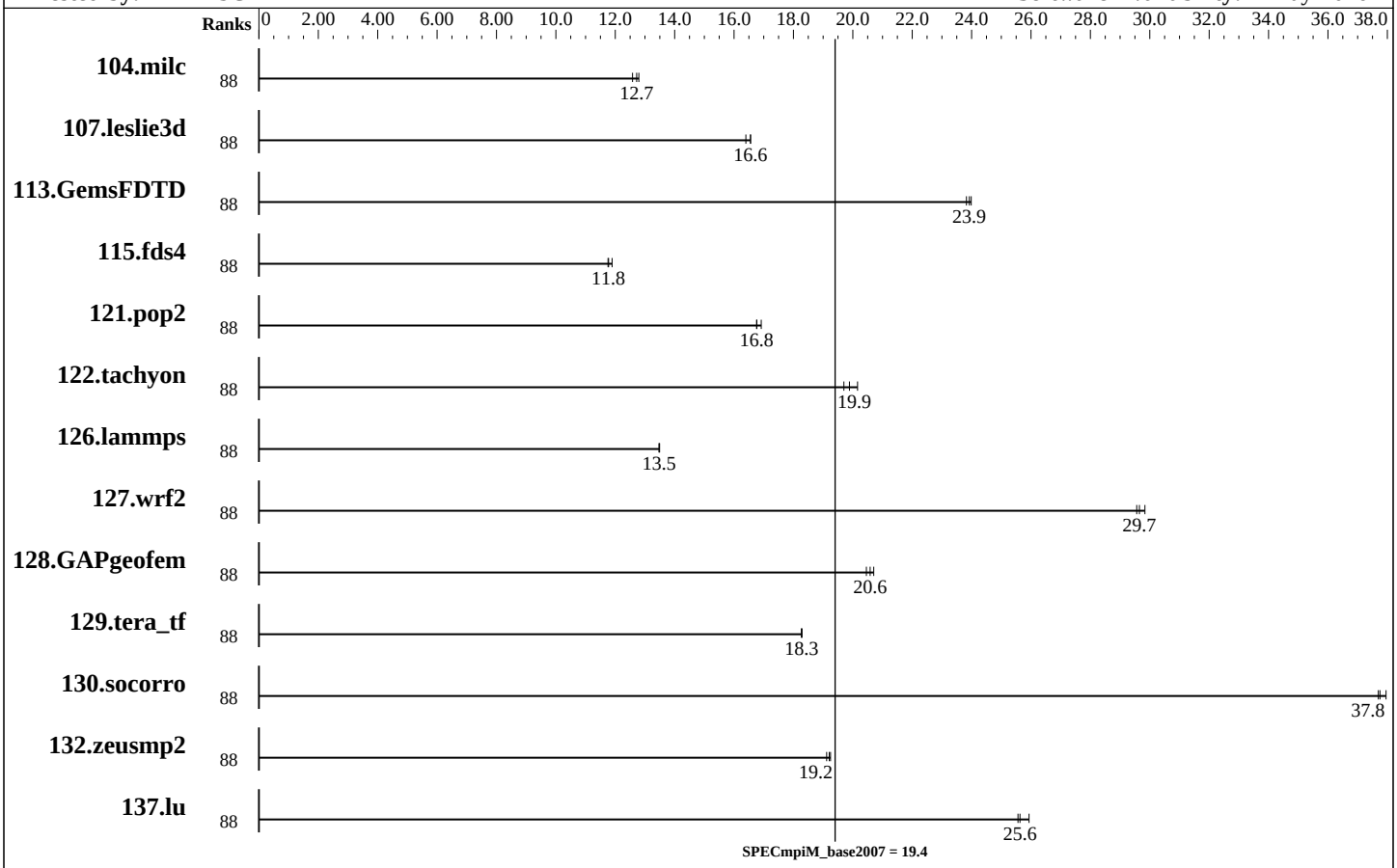
SGI Rackable C2112-4GP3
(Intel Xeon E5-2699 v4, 2.20 GHz)

SPECmpiM_peak2007 = Not Run

SPECmpiM_base2007 = 19.4

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	88	124	12.6	**123**	**12.7**	122	12.8							
107.leslie3d	88	318	16.4	315	16.6	**315**	**16.6**							
113.GemsFDTD	88	263	24.0	**264**	**23.9**	265	23.8							
115.fds4	88	166	11.8	164	11.9	**166**	**11.8**							
121.pop2	88	**246**	**16.8**	246	16.8	244	16.9							
122.tachyon	88	142	19.7	139	20.2	**141**	**19.9**							
126.lammps	88	216	13.5	216	13.5	**216**	**13.5**							
127.wrf2	88	264	29.6	261	29.8	**263**	**29.7**							
128.GAPgeofem	88	101	20.5	99.7	20.7	**100**	**20.6**							
129.tera_tf	88	152	18.3	151	18.3	**151**	**18.3**							

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	88	**101**	**37.8**	101	37.7	101	38.0							
132.zeusmp2	88	**162**	**19.2**	161	19.2	162	19.1							
137.lu	88	142	25.9	144	25.6	**143**	**25.6**							

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: 2
Total Chips: 4
Total Cores: 88
Total Threads: 88
Total Memory: 256 GB
Base Ranks Run: 88
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: 2
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

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(Intel Xeon E5-2699 v4, 2.20 GHz)

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MPI2007 license: 14
Test sponsor: SGI
Tested by: SGI

Test date: Mar-2016
Hardware Availability: Mar-2016
Software Availability: May-2016

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		Software
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	

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
```

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`

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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 Thu Mar 31 11:05:48 2016 by SPEC MPI2007 PS/PDF formatter v1463.
Originally published on 31 March 2016.