



SPEC® MPIM2007 Result

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Hewlett Packard Enterprise

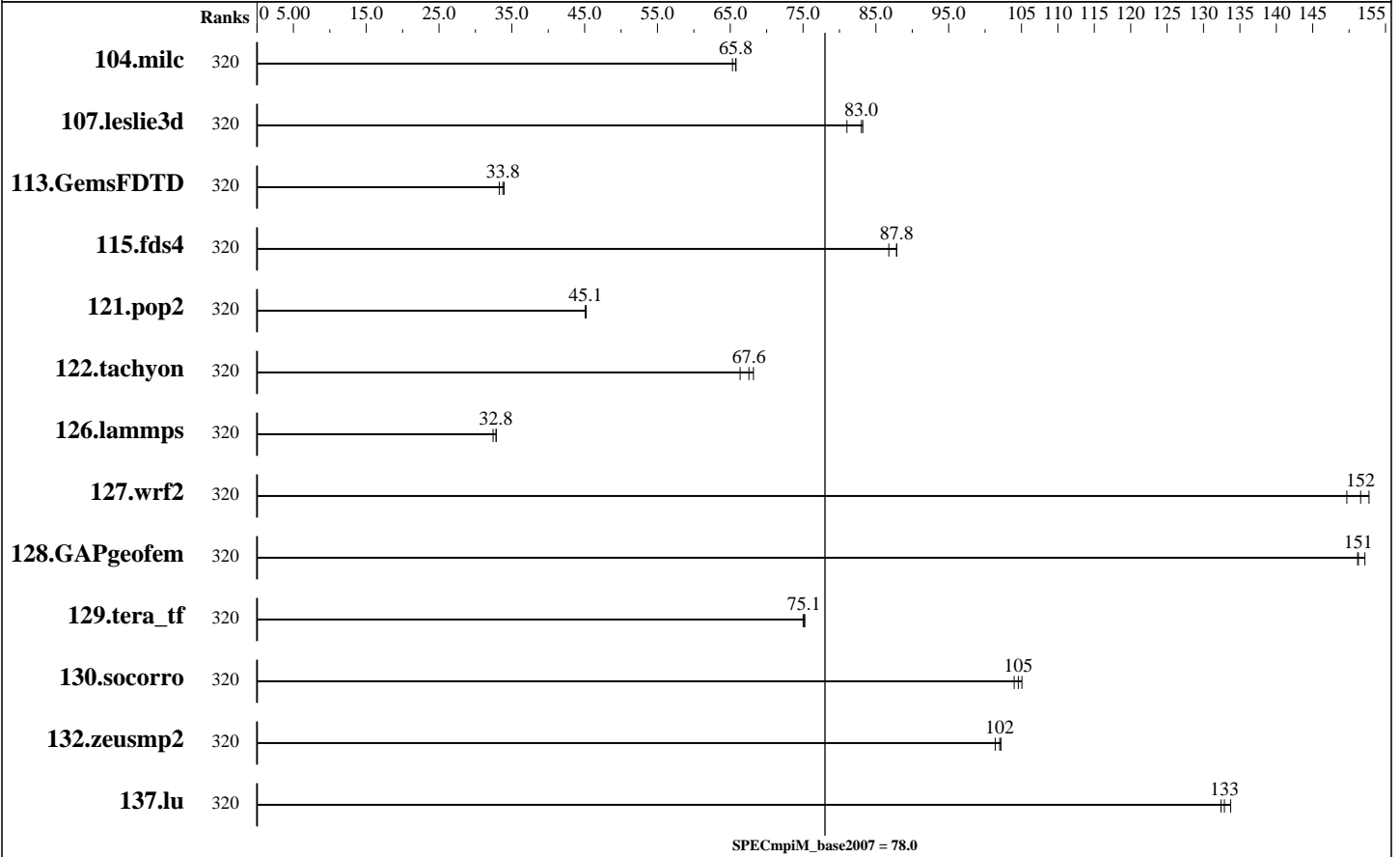
SPECmpiM_peak2007 = Not Run

SGI 8600
(Intel Xeon Gold 6148, 2.40 GHz)

SPECmpiM_base2007 = 78.0

MPI2007 license: 1
Test sponsor: HPE
Tested by: HPE

Test date: Oct-2017
Hardware Availability: Jul-2017
Software Availability: Nov-2017



Results Table

Benchmark	Base							Peak						
	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
104.milc	320	24.0	65.3	23.8	65.8	<u>23.8</u>	<u>65.8</u>							
107.leslie3d	320	62.7	83.2	64.4	81.0	<u>62.9</u>	<u>83.0</u>							
113.GemsFDTD	320	186	33.9	190	33.3	<u>187</u>	<u>33.8</u>							
115.fds4	320	<u>22.2</u>	<u>87.8</u>	22.2	87.9	22.5	86.8							
121.pop2	320	91.6	45.1	91.3	45.2	<u>91.5</u>	<u>45.1</u>							
122.tachyon	320	41.0	68.2	42.2	66.4	<u>41.4</u>	<u>67.6</u>							
126.lammps	320	88.7	32.9	89.9	32.4	<u>88.8</u>	<u>32.8</u>							
127.wrf2	320	<u>51.4</u>	<u>152</u>	52.1	150	51.0	153							
128.GAPgeofem	320	<u>13.7</u>	<u>151</u>	13.6	152	13.7	151							
129.tera_tf	320	36.9	75.0	36.8	75.2	<u>36.8</u>	<u>75.1</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	320	36.7	104	36.3	105	36.5	105									
132.zeusmp2	320	30.6	101	30.4	102	30.4	102									
137.lu	320	27.7	133	27.5	134	27.8	132									

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: HPE XA730i Gen10 Server Node
 Interconnect: InfiniBand (MPI and I/O)
 File Server Node: Lustre FS
 Total Compute Nodes: 8
 Total Chips: 16
 Total Cores: 320
 Total Threads: 640
 Total Memory: 1536 GB
 Base Ranks Run: 320
 Minimum Peak Ranks: --
 Maximum Peak Ranks: --

Software Summary

C Compiler: Intel C Composer XE for Linux, Version 18.0.0.128 Build 20170811
 C++ Compiler: Intel C++ Composer XE for Linux, Version 18.0.0.128 Build 20170811
 Fortran Compiler: Intel Fortran Composer XE for Linux, Version 18.0.0.128 Build 20170811
 Base Pointers: 64-bit
 Peak Pointers: Not Applicable
 MPI Library: HPE Performance Software - Message Passing Interface 2.17
 Other MPI Info: OFED 3.2.2
 Pre-processors: None
 Other Software: None

Node Description: HPE XA730i Gen10 Server Node

Hardware

Number of nodes: 8
 Uses of the node: compute
 Vendor: Hewlett Packard Enterprise
 Model: SGI 8600 (Intel Xeon Gold 6148, 2.40 GHz)
 CPU Name: Intel Xeon Gold 6148
 CPU(s) orderable: 1-2 chips
 Chips enabled: 2
 Cores enabled: 40
 Cores per chip: 20
 Threads per core: 2
 CPU Characteristics: Intel Turbo Boost Technology up to 3.70 GHz
 CPU MHz: 2400
 Primary Cache: 32 KB I + 32 KB D on chip per core
 Secondary Cache: 1 MB I+D on chip per core
 L3 Cache: 27.5 MB I+D on chip per chip
 Other Cache: None
 Memory: 192 GB (12 x 16 GB 2Rx4 PC4-2666V-R)
 Disk Subsystem: None
 Other Hardware: None
 Adapter: Mellanox MT27700 with ConnectX-4 ASIC
 Number of Adapters: 2
 Slot Type: PCIe x16 Gen3 8GT/s
 Data Rate: InfiniBand 4X EDR

Software

Adapter: Mellanox MT27700 with ConnectX-4 ASIC
 Adapter Driver: OFED-3.4-2.1.8.0
 Adapter Firmware: 12.18.1000
 Operating System: Red Hat Enterprise Linux Server 7.3 (Maipo), Kernel 3.10.0-514.2.2.el7.x86_64
 Local File System: LFS
 Shared File System: LFS
 System State: Multi-user, run level 3
 Other Software: SGI Management Center Compute Node 3.5.0, Build 716r171.rhel73-1705051353

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Node Description: HPE XA730i Gen10 Server Node

Ports Used: 1
Interconnect Type: InfiniBand

Node Description: Lustre FS

Hardware

Number of nodes: 4
Uses of the node: fileserver
Vendor: Hewlett Packard Enterprise
Model: Rackable C1104-GP2 (Intel Xeon E5-2690 v3, 2.60 GHz)
CPU Name: Intel Xeon E5-2690 v3
CPU(s) orderable: 1-2 chips
Chips enabled: 2
Cores enabled: 24
Cores per chip: 12
Threads per core: 1
CPU Characteristics: Intel Turbo Boost Technology up to 3.50 GHz
Hyper-Threading Technology disabled
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: 30 MB I+D on chip per chip
Other Cache: None
Memory: 128 GB (8 x 16 GB 2Rx4 PC4-2133P-R)
Disk Subsystem: 684 TB RAID 6
48 x 8+2 2TB 7200 RPM
Other Hardware: None
Adapter: Mellanox MT27700 with ConnectX-4 ASIC
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
Adapter Driver: OFED-3.3-1.0.0.0
Adapter Firmware: 12.14.2036
Operating System: Red Hat Enterprise Linux Server 7.3 (Maipo),
Kernel 3.10.0-514.2.2.el7.x86_64
Local File System: ext3
Shared File System: LFS
System State: Multi-user, run level 3
Other Software: None

Interconnect Description: InfiniBand (MPI and I/O)

Hardware

Vendor: Mellanox Technologies and SGI
Model: SGI P0002145
Switch Model: SGI P0002145
Number of Switches: 1
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

Base Tuning Notes

src.alt used: 129.tera_tf->add_rank_support
src.alt used: 130.socorro->>nullify_ptrs

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_IMM_UPGRADE=false
export MPI_CONNECTIONS_THRESHOLD=0
export MPI_IB_DCIS=2
export MPI_IB_HYPER_LAZY=false
ulimit -s unlimited
```

BIOS settings:

AMI BIOS version SAED7177, 07/17/2017

Job Placement:

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

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:

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Base Compiler Invocation (Continued)

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-AVX512 -no-prec-div -ipo

C++ benchmarks:

126.lammps: -O3 -xCORE-AVX512 -no-prec-div -ansi-alias -ipo

Fortran benchmarks:

-O3 -xCORE-AVX512 -no-prec-div -ipo

Benchmarks using both Fortran and C:

-O3 -xCORE-AVX512 -no-prec-div -ipo

Base Other Flags

C benchmarks:

-lmpi

C++ benchmarks:

126.lammps: -lmpi

Fortran benchmarks:

-lmpi

Benchmarks using both Fortran and C:

-lmpi



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The flags file that was used to format this result can be browsed at

http://www.spec.org/mpi2007/flags/HPE_x86_64_Intel18_flags.html

You can also download the XML flags source by saving the following link:

http://www.spec.org/mpi2007/flags/HPE_x86_64_Intel18_flags.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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