



SPEC® MPIM2007 Result

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Hewlett Packard Enterprise

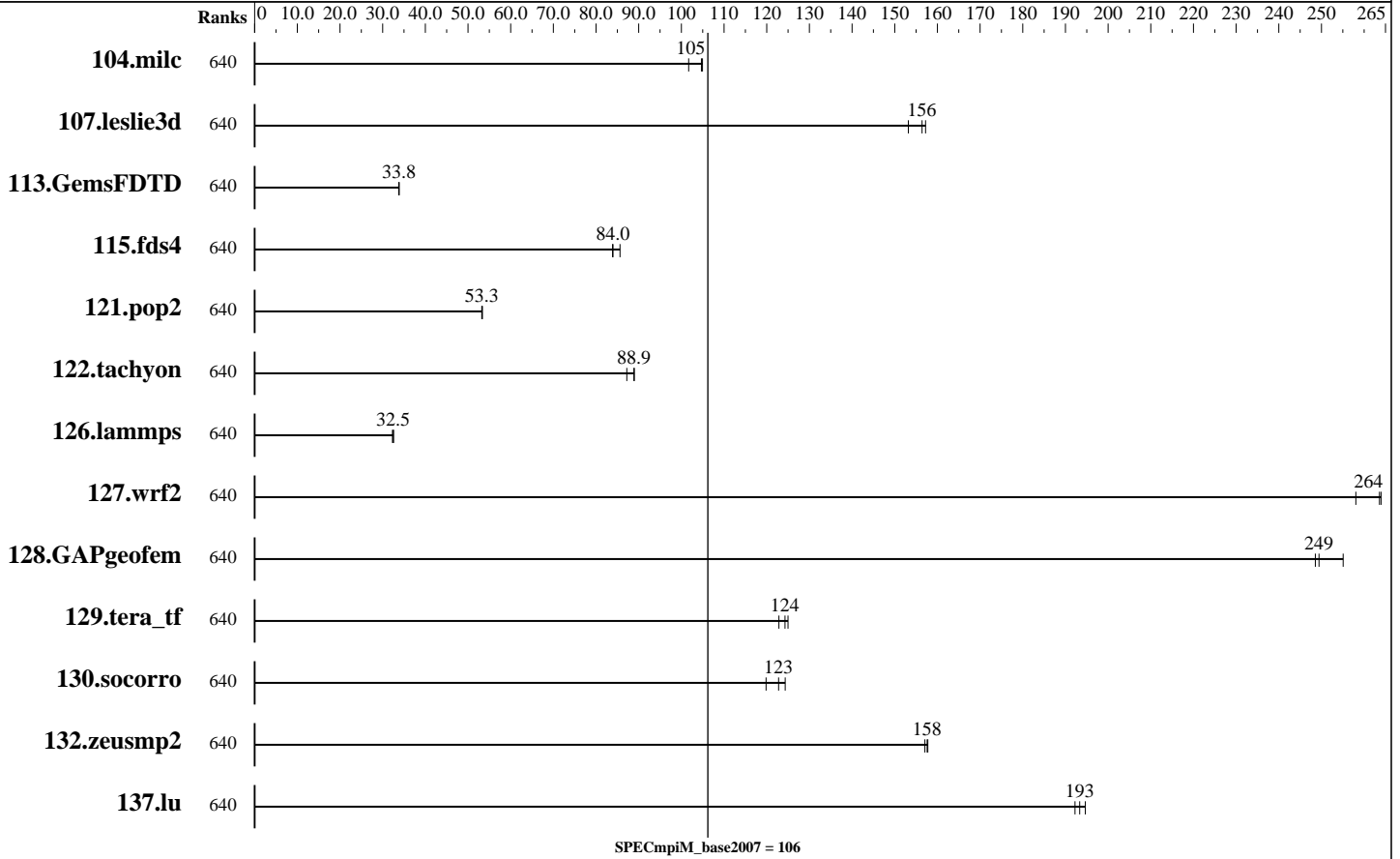
SPECmpiM_peak2007 = Not Run

SGI 8600
(Intel Xeon Gold 6148, 2.40 GHz)

SPECmpiM_base2007 = 106

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	640	15.4	102	14.9	105	<u>14.9</u>	<u>105</u>							
107.leslie3d	640	34.1	153	33.2	157	<u>33.4</u>	<u>156</u>							
113.GemsFDTD	640	187	33.8	<u>186</u>	<u>33.8</u>	186	33.9							
115.fds4	640	23.3	83.9	22.8	85.6	<u>23.2</u>	<u>84.0</u>							
121.pop2	640	77.5	53.2	<u>77.5</u>	<u>53.3</u>	77.3	53.4							
122.tachyon	640	31.4	89.0	<u>31.5</u>	<u>88.9</u>	32.1	87.2							
126.lammps	640	90.3	32.3	89.6	32.5	<u>89.7</u>	<u>32.5</u>							
127.wrf2	640	29.5	264	30.2	258	<u>29.6</u>	<u>264</u>							
128.GAPgeofem	640	8.10	255	8.31	249	<u>8.28</u>	<u>249</u>							
129.tera_tf	640	22.1	125	22.5	123	<u>22.3</u>	<u>124</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	640	30.7	124	<u>31.1</u>	<u>123</u>	31.8	120							
132.zeusmp2	640	19.8	157	<u>19.7</u>	<u>158</u>	19.7	158							
137.lu	640	19.1	192	18.9	195	<u>19.0</u>	<u>193</u>							

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: 16
 Total Chips: 32
 Total Cores: 640
 Total Threads: 1280
 Total Memory: 3 TB
 Base Ranks Run: 640
 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: 16
 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: 2
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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