



# SPEC® MPIM2007 Result

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## Hewlett Packard Enterprise

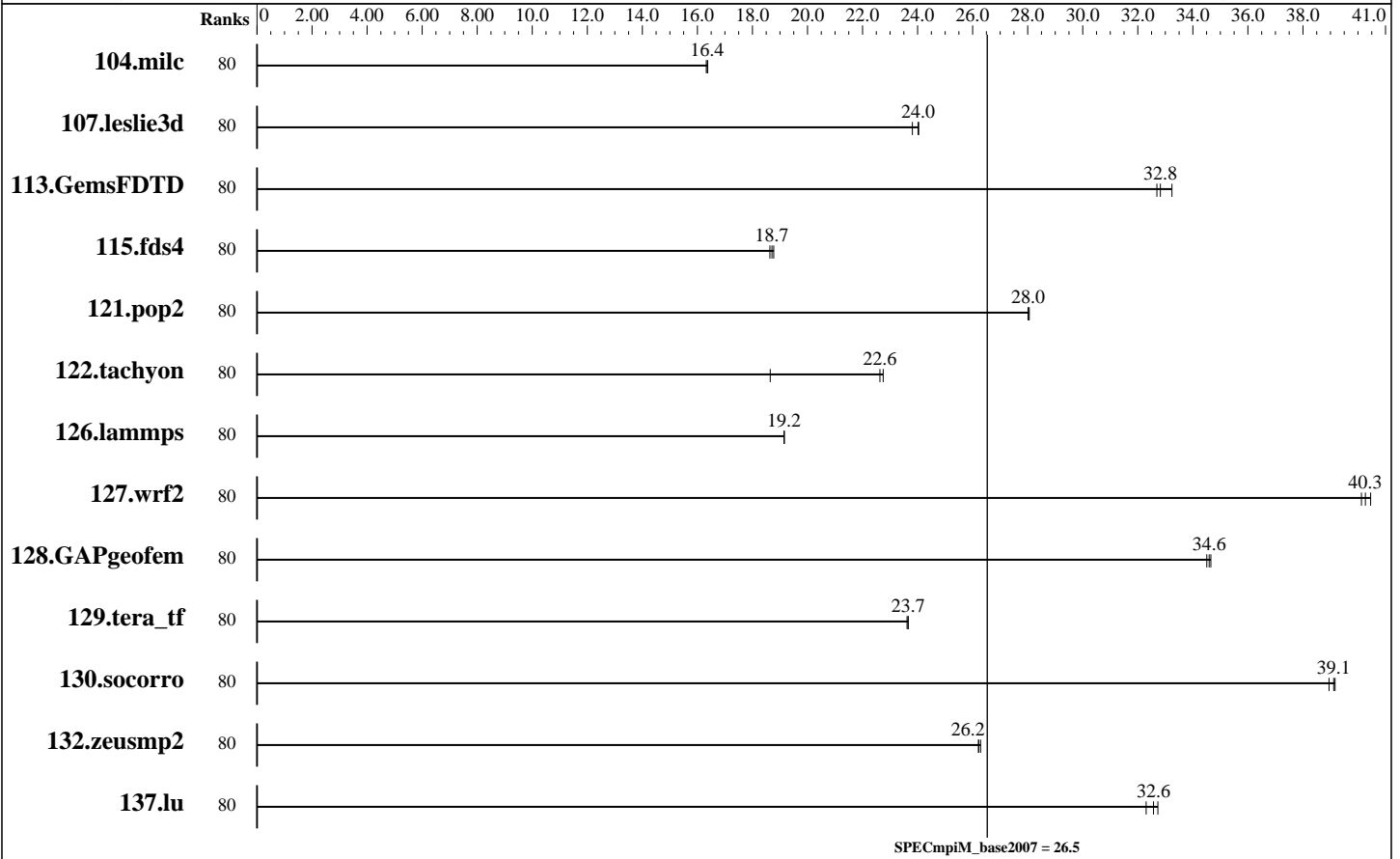
SPECmpiM\_peak2007 = Not Run

SGI 8600  
(Intel Xeon Gold 6148, 2.40 GHz)

SPECmpiM\_base2007 = 26.5

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	80	<u>95.6</u>	<u>16.4</u>	95.6	16.4	95.9	16.3									
107.leslie3d	80	<u>217</u>	<u>24.0</u>	219	23.8	217	24.0									
113.GemsFDTD	80	193	32.7	190	33.2	<u>192</u>	<u>32.8</u>									
115.fds4	80	<u>104</u>	<u>18.7</u>	104	18.8	105	18.6									
121.pop2	80	<u>147</u>	<u>28.0</u>	147	28.1	147	28.0									
122.tachyon	80	123	22.7	<u>124</u>	<u>22.6</u>	150	18.6									
126.lammps	80	<u>152</u>	<u>19.2</u>	152	19.2	152	19.1									
127.wrf2	80	193	40.5	<u>194</u>	<u>40.3</u>	194	40.1									
128.GAPgeofem	80	59.6	34.7	59.8	34.5	<u>59.7</u>	<u>34.6</u>									
129.tera_tf	80	117	23.7	<u>117</u>	<u>23.7</u>	117	23.6									

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	80	<u>97.6</u>	<u>39.1</u>	98.0	38.9	97.5	39.2							
132.zeusmp2	80	<u>118</u>	<u>26.2</u>	118	26.2	118	26.3							
137.lu	80	112	32.7	<u>113</u>	<u>32.6</u>	114	32.3							

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: 2  
 Total Chips: 4  
 Total Cores: 80  
 Total Threads: 160  
 Total Memory: 384 GB  
 Base Ranks Run: 80  
 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: 2  
 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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Standard Performance Evaluation Corporation

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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](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](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](mailto:webmaster@spec.org).

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