



# SPEC® MPIL2007 Result

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## Hewlett Packard Enterprise

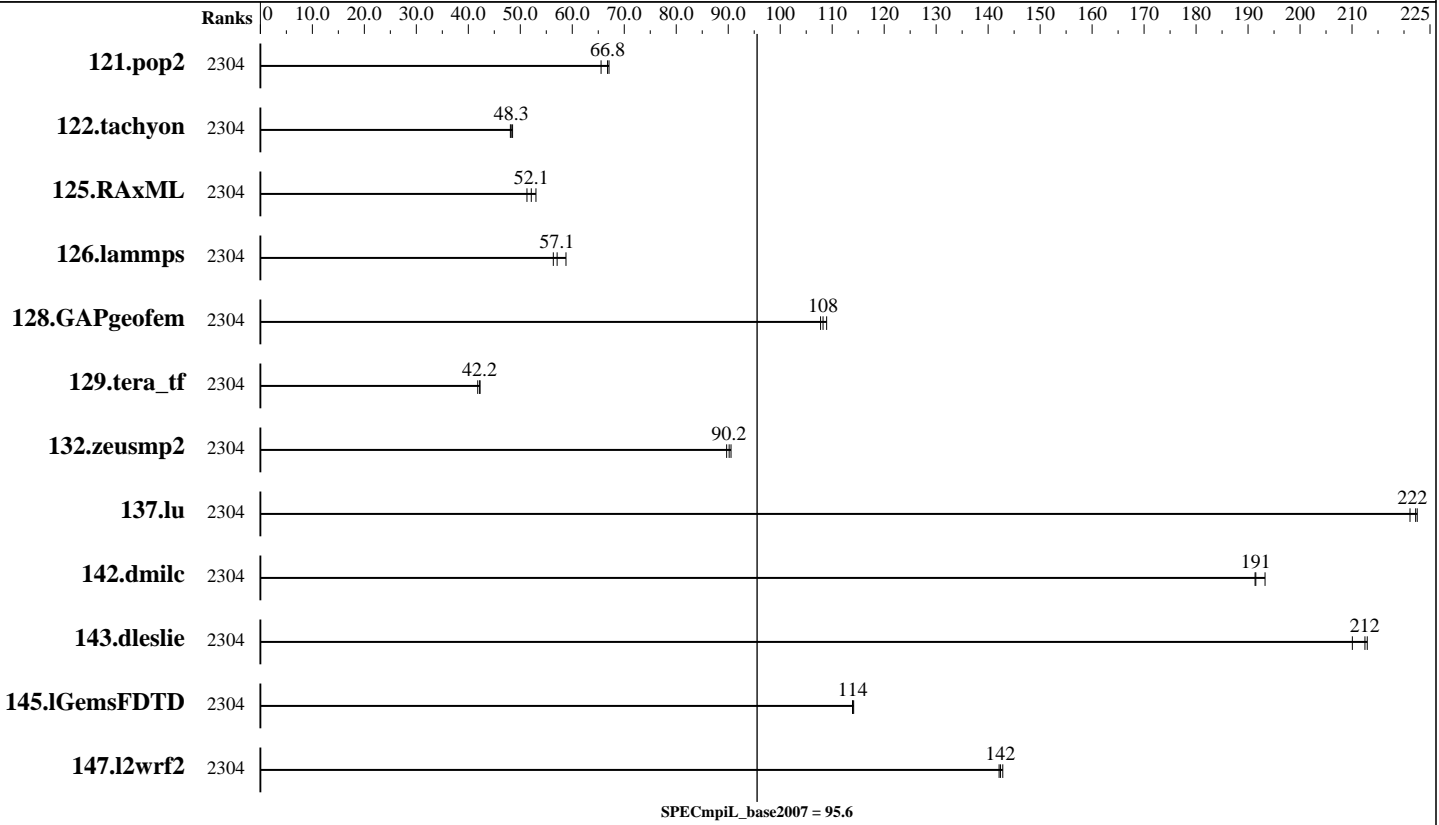
SPECmpiL\_peak2007 = Not Run

SGI 8600  
(Intel Xeon Gold 6148, 2.40 GHz)

SPECmpiL\_base2007 = 95.6

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
121.pop2	2304	59.4	65.5	<b>58.3</b>	<b>66.8</b>	58.0	67.1							
122.tachyon	2304	40.4	48.1	40.1	48.5	<b>40.3</b>	<b>48.3</b>							
125.RAxML	2304	55.1	53.0	56.9	51.3	<b>56.0</b>	<b>52.1</b>							
126.lammps	2304	<b>43.1</b>	<b>57.1</b>	41.8	58.8	43.6	56.3							
128.GAPgeofem	2304	<b>54.8</b>	<b>108</b>	54.5	109	55.1	108							
129.tera_tf	2304	26.3	41.8	<b>26.1</b>	<b>42.2</b>	26.0	42.3							
132.zeusmp2	2304	23.4	90.5	<b>23.5</b>	<b>90.2</b>	23.6	89.7							
137.lu	2304	19.0	221	<b>18.9</b>	<b>222</b>	18.9	223							
142.dmilc	2304	<b>19.2</b>	<b>191</b>	19.3	191	19.1	193							
143.dleslie	2304	<b>14.6</b>	<b>212</b>	14.8	210	14.6	213							
145.lGemsFDTD	2304	38.7	114	<b>38.7</b>	<b>114</b>	38.6	114							
147.l2wrf2	2304	57.7	142	<b>57.6</b>	<b>142</b>	57.4	143							

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

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### 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: 64  
Total Chips: 128  
Total Cores: 2560  
Total Threads: 5120  
Total Memory: 12 TB  
Base Ranks Run: 2304  
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: 64  
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  
Ports Used: 1  
Interconnect Type: InfiniBand

### 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

## Node Description: Lustre FS

### Hardware

Number of nodes: 4  
Uses of the node: fileserver

### Software

Adapter: Mellanox MT27700 with ConnectX-4 ASIC  
Adapter Driver: OFED-3.3-1.0.0.0

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### Node Description: Lustre FS

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

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: 8  
Number of Ports: 36  
Data Rate: InfiniBand 4X EDR  
Firmware: 11.0350.0394  
Topology: Enhanced Hypercube  
Primary Use: MPI and I/O traffic

#### Software

### Base Tuning Notes

src.alt used: 143.dleslie->integer\_overflow



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## 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_IB_DCIS=2
export MPI_IB_HYPER_LAZY=false
export MPI_CONNECTIONS_THRESHOLD=0
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:

126.lammps: icpc

### Fortran benchmarks:

ifort

### Benchmarks using both Fortran and C:

icc ifort

## Base Portability Flags

121.pop2: -DSPEC\_MPI\_CASE\_FLAG



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## 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

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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